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Report 254

Metallogenic Map Series:

Wollaston Lake, NTS Area 64L

First Edition, 1988

compiled by D.G. MacDougall

TAZIN LAKE 74 N
FOND-DU-LAC 74 O
STONY RAPIDS 74 P
PHELPS LAKE 64 M
WILLIAM RIVER 74 K
LIVINGSTONE LAKE 74 J
PASFIELD LAKE 74 I
WOLLASTON LAKE 64 L
LLOYD LAKE 74 F
CREE LAKE 74 G
GEIKIE RIVER 74 H
REINDEER LAKE NORTH 64 E
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ILE-A-LA-CROSSE 73 O
LAC LA RONGE 73 P/73 I
PELICAN NARROWS 63 M/63 N
AMISK LAKE 63 L/63 K

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Mineral Development Branch

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Metallogenic Notes

Of the over 300 mineral occurrences in the Wollaston Lake map sheet (NTS 64L), three-quarters are within the Wollaston Domain which underlies about half of the area. Those remaining are distributed nearly equally between the Mudjatik Domain, the Peter Lake Domain and the sub-Athabasca Group unconformity.

The following major types of mineralization are distinguished:

1) sediment-hosted, disseminated to massive copper, molybdenum, iron, zinc, lead and arsenic sulphides and graphite;
2) sulphide- and oxide-facies banded iron formation;
3) uranium mineralization related to the sub-Athabasca unconformity;
4) concentrations of lead, copper, nickel and uranium in the sub-Athabasca regolith;
5) uranium, thorium and molybdenum mineralization in pegmatitic calc-silicate rocks and granite pegmatites;
6) copper, nickel and iron sulphides disseminated in basic and ultrabasic rocks;
7) molybdenum, copper and uranium mineralization in granitic differentiates;
8) vein-type occurrences of copper, iron and molybdenum sulphides and graphite; and
9) miscellaneous mineral occurrences, including fluorite, apatite, cancrinite, zircon, and rare earth element (REE) concentrations.

1) Sediment-Hosted Mineralization

Sediment-hosted mineralization predominates in the Wollaston Domain, within Aphebian Wollaston Group supracrustals. It appears to be stratigraphically controlled, and concentrated in and at the contacts of particular rock types. Contacts may in some cases represent unconformities (211, 212) or overthrust unconformities (216). Within the Mudjatik Domain, pelitic to psammopelitic supracrustals (unit Mpsn), which are presumed to be lateral equivalents of the Wollaston Group (161), are the singular host to this type of mineralization.

The relationships between various elemental associations, mineral parageneses and major rock types are illustrated in Table 1.

Over half of all occurrences are found in quartzite (52 percent), with progressively lesser numbers in meta-arkose (15 percent), pelite (13 percent), calc-silicate rocks (11 percent), greywacke (2 percent) and miscellaneous rock types (7 percent). In terms of the relative importance of each of the major lithologies, quartzite is the most common host rock for ten of the twelve parageneses and, in the case of the Zn±Pb paragenesis (VII), is almost exclusively the host. Two parageneses, U+Th±C±Mo±REE (IV) and Cu-Fe-C±U (V), are most commonly found in calc-silicate rocks, while another, Cu-Ni-Fe±As (XII), occurs equally in quartzite and calc-silicate rocks.

The sediment-hosted occurrences are concentrated in four main areas of the Wollaston Domain, each represented by several mineral parageneses in distinct, only partially overlapping, adjoining subareas that form a rough zoned pattern (see inset figure on map face). The areas are: 1) Hidden Bay, 2) Hydichuk-Ooms Lakes, 3) Heming Bay-Anderson Lake, and 4) Charcoal Lake-Cochrane River. Banded iron formation is present in association with the first three. Regional variation is characterized by Cu-Fe dominated parageneses in the northeast, giving way southwestwards along strike to U-C bearing parageneses and southeastwards, across strike, to Zn±Pb dominated ones.

Elsewhere, individual mineral parageneses occur in isolation. Areas of Fe (I) and Cu-Fe (II) mineralization are closely associated with the Keeler Peninsula and Wellbelove Bay iron formations, respectively.

Quartzite-Hosted Zn-Pb Mineralization

The Zn-dominant paragenesis (VII) at Hydichuk-Ooms Lakes and the Cu-Zn dominant paragenesis (IX) here and at Charcoal Lake-Cochrane River are similar in many respects to parageneses characterizing the deposits at George, Hills, Sito and Fable Lakes, and mineralization elsewhere in the Wollaston Domain (135, 153, 163, 206, 251).

Coombe (19) has compared the Zn-Pb mineralization in the Wollaston Group to quartzite-hosted Zn-Pb deposits at Laisvall, Sweden; Largentière, France; Bou-Sellam, Morocco; Kroussou, Gabon; and Cape Breton Island, Nova Scotia. It is also somewhat similar to zinc-barite mineralization in Dalradian schists in Scotland (17) and to stratabound lead-zinc deposits in southeastern British Columbia (148). Such deposits are argued by Bjorlykke and Sangster (6) to be formed by metal-charged groundwater passing through sandstones into a reduced H_2S-rich environment to precipitate sulphides. Key factors are 1) slightly enriched basement source, 2) deep weathering and 3) release of lead from feldspars.

Similar sediment-hosted Cu-Zn-Pb mineralization in the Wollaston Group of the Kasmere-Whiskey Jack Lakes area of Manitoba (271) is zoned, concentrated at the Aphebian/Archean unconformity and superimposed by vein-type mineralization. Primary lithology appears to have exercised the main control over mineralization, and zonation is thought to mark increasing distance from a paleoshore, as in the Zambian Copper Belt. Abundant associated scapolite calc-silicate rocks possibly reflect a sabkha-type environment. The

Table 1 – Distribution of Sediment-Hosted Mineralization

	Elements	Mineral Paragenesis[1]	Percent Sediment-Hosted	Host Lithology (Percent of Total)[2]					
				1	2	3	4	5	6
I	Fe	po – py ± ma ± il ± mag ± hem	20	61	11	7	0	21	0
II	Cu – Fe	cp – py – po ± mal ± mag ± hem ± ma ± bo ± cov ± Cu ± gf ± il	19	63	18	19	0	0	0
III	Fe – C	gf – py – po ± mo	8	46	27	27	0	0	0
IV	U + Th ± C ± Mo ± REE	U/Th (unidentified) – u (secondary) ± pch ± ur ± mo ± gf	7	20	20	10	0	50	0
V	Cu – Fe – C ± U	gf – cp – py – po ± u ± ap ± bo ± hem ± asp	7	15	15	30	0	40	0
VI	Mo – Fe ± As	mo – po – py ± asp ± pow ± gf ± il ± mag	6	69	19	12	0	0	0
VII	Zn – Fe ± C ± Pb	sp – py – po + gf ± gn ± asp ± mo	6	88	6	0	6	0	0
VIII	Cu – Mo – Fe ± C ± As	cp – py – po – mo + asp + gf ± mag	6	44	28	22	0	6	0
IX	Cu – Zn – Fe ± C ± Pb ± As ± Ti	cp – sp – po – py – gf + mag + il + ma + asp ± gn ± mo ± hem	6	56	22	5	0	5	12
X	Fe ± As ± C ± U	py – po – asp – gf + u (secondary) ± pch ± ur ± u ± ery	6	61	17	17	5	0	0
XI	Cu – Ni – Fe ± As	po – py ± cp ± asp ± ann	3	50	0	0	0	50	0
XII	Cu	cp – bo – az	2	66	34	0	0	0	0
	Other		4			not applicable			

[1]refer to "Table of Mineral Occurrences" for explanation of mineral abbreviations.
[2]host lithologies: 1) quartzite; 2) arkose; 3) pelite; 4) greywacke; 5) calc-silicate; 6) other.

– essential
+ accessory
± uncommon or rare

Archean basement, containing higher than clarke values of Zn and Pb, was the ultimate source of metals.

Large (160) has proposed a generalized deposit model, the main features of which resemble those of Wollaston Group mineralization, for massive sulphide Pb-Zn deposits in Ireland, British Columbia, Yukon, northern Australia and Germany. Deposits are described as tabular, stratiform, a few tens of metres thick and as having lateral dimensions in the order of hundreds or thousands of metres. They are essentially stratabound, occurring *en echelon* within stratigraphic intervals of less than a thousand metres, or at intervals laterally within a narrower stratigraphic horizon. Both lateral and vertical concentric zonation in elements and mineral phases are present. Crosscutting vein-type stockworks may represent feeder zones, remobilizates or synsedimentary/diagenetic features due to solution collapse and brecciation or volume change.

Quartzite and Arkose-Hosted Cu-Mo Mineralization

Molybdenum (VI) and copper-molybdenum (VIII) dominant parageneses are restricted to Heming Bay-Anderson Lake, where they occur primarily in quartzite but also in meta-arkose and pelite.

Arkose-hosted copper mineralizations (II, V and XII) are found in outcrop in the Hidden-Pow Bays area (SMDI No. 1714b, EXMI Nos. 33 and 56), in boulders and outcrop in the Hooker-Heinz Lakes area (EXMI Nos. 16 and 17) or as outcrops in widely separated

locations (EXMI Nos. 62 and 108, SMDI No. 644a). A sample from SMDI No. 1714b assayed 0.34 g/t (0.01 oz./ton) Au and 3.4 g/t (0.1 oz./ton) Ag.

Occurrences elsewhere in the Wollaston Domain (e.g., Janice, Kaz and Rafuse Lakes, 250) have been considered as similar to syngenetic or early diagenetic mineralizations of the Zambian Copper Belt (Precambrian Cu-Co-Mo), the Kupferschiefer of Germany (Permian Cu-Pb-Zn) and the cupriferous Precambrian sandstones of Udokan, eastern Siberia (134, 163, 167, 170, 210). Stratabound Cu-U-Au-REE mineralization at the Olympic Dam deposit, Roxby Downs, South Australia (219) may also have some features in common.

In the Zechstein copper deposits (Kupferschiefer) of Poland, Kucha (159) notes that concentrations of gold and platinum group metals and a wide range of other elements including Ni, Co, V, U, Mo, Re, As, Bi, and Se are present in a layer a few centimetres thick at the boundary between rocks of oxic and anoxic facies. Copper occurrences in the Wollaston Group may thus merit evaluation for noble metals. One such polymetallic association with gold values is already recognized at Duddridge Lake in the southern end of the Wollaston Domain (172).

2) Banded Iron Formation

Nine iron formation horizons have been identified, all within the Wollaston Group. Seven are in the basal pelitic-psammopelitic gneiss (unit Wpsn), one is in amphibolite (unit Wms) and one in calcareous psammitic gneiss (unit Wrc).

Seven of the iron formations are distinguished by outcrop or diamond drilling, as well as by their distinctive airborne and ground magnetic signatures; two are inferred from magnetic data alone (Table 2).

The sulphide/oxide-facies iron formations are present as disseminated to massive sulphides (up to 30 percent pyrite and pyrrhotite) and oxides (magnetite and up to 35 percent ilmenite), sometimes with graphite (up to 60 percent), arsenopyrite and traces of chalcopyrite. Host rocks are quartzite, arkosic quartzite, calcareous arkose, quartz-hornblende gneiss, greywacke and biotite-garnet gneiss.

The sulphide/silicate/oxide-facies iron formations are represented by disseminated to massive iron oxides (10 to 80 percent magnetite) and sulphides (7 to 25 percent pyrite/pyrrhotite) hosted by iron silicate rich metasediments, including amphibole-garnet gneiss, calc-silicate gneiss and biotite-garnet gneiss with intercalated quartzite.

The sulphide-facies iron formations occur as disseminated to massive (up to 50 percent) pyrite and pyrrhotite with minor graphite and chalcopyrite in biotite psammite, arkose, arkosic quartzite and quartzite.

Table 2 – Banded Iron Formations in the Wollaston Group

	Name	*Facies*	*Representative Occurrences*
1	Charcoal Lake – Cochrane River	oxide + sulphide sulphide	SMDI 648d EXMI 151
2	Wellbelove Bay	oxide + sulphide + silicate	SMDI 636a
3	Keeler Peninsula	sulphide	SMDI 635a & c, EXMI 116
4	Gallagher – Habkirk Lakes[1]	oxide + sulphide sulphide	SMDI 633a SMDI 633c
5	Matthews Bay Southwest	oxide + sulphide + silicate	SMDI 1940
6	Richardson Bay North	oxide + sulphide	SMDI 635b
7	Otter Bay	weak sulphide	EXMI 121, 130 & 131
8	Watson Lake – McLeod Bay[2]		
9	East Charcoal Lake[2]		

[1] aeromagnetic and ground magnetic anomalies indicate its extension southwest as far as McRae Bay
[2] inferred from aeromagnetic highs alone

The sulphide/oxide-facies and sulphide-facies occurrences are with few exceptions not iron rich; they are classified as lean iron formation.

None of these iron formations have been studied in detail, but those of sulphide/silicate/oxide facies (2 and 5, Table 2) appear similar to Wollaston Group-hosted iron formation at Spence Lake, described by Coombe (20) and classified by Harper (136) as type E metataconite. They show some "Superior-type" characteristics, such as association with shallow-water marine detrital and chemical sediments, considerable areal extent and presence of volcanic rocks in the succession (16).

Numerous examples of gold and base metal mineralization associated with iron formation have been recognized and described in the literature (e.g., the Homestake gold deposit (175), the Lupin deposit (22), the Cullaton Lake B zone (209), the Sulphide Lake A and B zones (37), the Nistoassini Lakes area Churchill Minerals showing (137) and Twin zone (136). These deposits are hosted by successions which are significantly different from the Wollaston Group,

both lithologically and in their depositional environment. The discovery of gold associated with iron formation in rocks correlative with the Wollaston Group at Ithingo Lake in the Mudjatik Domain (196) does, however, suggest that the gold potential of Wollaston Group iron formations should be assessed.

3) Unconformity-Related Uranium Mineralization

Most (58 percent) of the sub-Athabasca Group unconformity-related uranium occurrences and deposits are underlain or hosted by graphitic pelitic to psammopelitic gneisses of either the Wollaston or Mudjatik Domains. Many of them are located close to the contact between the presumed Aphebian supracrustals and granitoid rocks of suggested Archean age. Calc-silicate rich assemblages underlie or host most other deposits.

Eight major unconformity uranium deposits occur in the southeastern part of the area; details of these are given in Table 3

The main geological characteristics of the deposits have been summarized by Sibbald (262) as follows:

1) **Proximity to the Sub-Athabasca Unconformity** — High-grade ore straddles the unconformity and mineralization extends for hundreds of metres above and below it.
2) **Proximity to Graphitic Pelites** — An apparent control by basement stratigraphy. Ore grade is independent of graphite concentration (142, 151).
3) **Structural Controls** — Post-Athabasca reverse faults or normal faults; topographic 'bumps' in the basement; solution collapse structures in basement carbonates or Athabasca Group quartz-sandstones. Faults are located preferentially along graphitic pelite/granitoid gneiss contacts (Collins Bay A and B (151)) and may displace the unconformity by several tens of metres (Rabbit Lake, Collins Bay A and B), or may merely disturb but not displace the basement (McClean Lake, Dawn Lake (270, 15)). Basal Athabasca Group conglomerates wedge out against the bumps in the basement topography, showing that these are predepositional features (15). In the Athabasca Group sandstones, solution collapse structures (141, 258) are accompanied by evidence of quartz grain corrosion, residual clay enrichment, volume decrease reflected by a sag of conglomerate horizons over the deposits (Dawn Lake (15), McClean Lake (270)), and fracturing and brecciation at higher levels (260).
4) **High Grades** — Up to 12 percent U.
5) **Primary Pitchblende and Coffinite Mineralogy**
6) **Complex Mineralogy and Geochemistry** — A diverse but variably concentrated suite of elements, including Ni, Co, As, Cu, Mo, Pb, Zn, Fe, V, Ag, Au, Pt, Se and S, is associated with uranium as arsenides, sulphides, sulpharsenides, selenides, oxides, and native copper, gold and selenium. For example, Rabbit Lake and Eagle Point contain essentially uranium, whereas the McClean Lake, Dawn Lake and Collins Bay B deposits contain considerable nickel and arsenic, and the Collins Bay A deposit also has silver and gold (151, 270, 15). Mineral and geochemical zonation is apparent at Collins Bay B and McClean Lake (63).
7) **Presence of Glassy Hydrocarbons** — In the ore and in the mineralized alteration envelope.
8) **Extensive Alteration Envelopes** — Mg-chloritization, Mg-tourmalinization, hematization, illitization, silicification and dolomitization (142, 145). Evidence for other alteration processes includes destruction of graphite in basement rocks, corrosion of quartz and formation of residual clay seams and caps in the Athabasca Group sandstone, the removal of hematite (bleaching) and the development of euhedral quartz±siderite±pyrite±hematite-filled fractures.
9) **Age of Initial Mineralization** — Dated at ca. 1300 Ma, initial mineralization postdates deposition of the Athabasca Group. Another major event recorded by ages of ca. 1100 Ma represents reworking of existing mineralization in some deposits or the initial stage of mineralization in others (23, 144, 162).

Dahlkamp and Adams (24) provided a summary of the evidence, debate and controversy over the source of ore elements, pre-enrichment and enrichment of ore minerals; mechanism, age and temperature of ore deposition and the remobilization and redistribution of the mineralization.

Four categories of genetic model have been identified by Hoeve et al. (146): 1) near-surface supergene, 2) magmatic hydrothermal, 3) diagenetic hydrothermal (reductant plume), and 4) multicycle process.

The diagenetic hydrothermal (reductant plume) model (142, 270) is the most widely accepted. The steps and conditions envisaged for mineralization are:

1) Oxidizing basinal brines containing trace amounts of U, Ni, Co, As, Cu, Zn, etc. enter the basement along fractures.
2) The brines react with the wallrock and are reduced and charged with CO_2, CH_4 (from graphite), H_2S (from sulphides) and Fe, K and Mg (from silicates). Some deposits (e.g., Eagle Point) are interpreted as having formed at this stage.
3) The reduced chemically changed fluids re-emerge and mix with basinal brines at or near the unconformity. Other deposits (e.g., Collins Bay B) may have formed at this point. The zone of mixing and reaction between the basinal brines and re-emerging fluids creates a stationary redox surface at which mineralization occurs. The shape of the redox

Table 3 – Major Athabasca Basin Unconformity-Type Uranium Deposits[1]

SMDI No.	Deposit Name	Ownership	Found	Reserves (tonnes U)	Grade (% U)	Athabasca Gp. Thickness (m)	Basement Rock Types	Depth[2] (m)	Remarks
1713	Rabbit Lake	Eldorado Resources Ltd.	1968	15 500	0.4	absent (eroded)	meta-arkose, plagioclasite (in part graphitic), calc-silicate dolomitic marble, granite segregation pegmatite, microgranite	0-200	in hanging wall of Rabbit Lake thrust fault; subcrop below drift; mineralized boulder train; mined out
617	Collins Bay A zone	Eldorado Resources Ltd.	1971	6 500	9.7	absent (eroded)	pelitic graphitic gneiss, granite segregation pegmatite in contact with granitoid gneiss	5-20	in clay zone at Athabasca Group unconformity in hanging wall of Collins Bay thrust fault; subcrop below drift; mineralized boulder train
621	Collins Bay B zone	Eldorado Resources Ltd.	1977	11 900	0.4	25	pelitic graphitic gneiss, granite segregation pegmatite in contact with granitoid gneiss	5-30	mainly in Athabasca Group in footwall of Collins Bay thrust fault; subcrop below drift
621	Collins Bay D zone	Eldorado Resources Ltd.	1979	1 900	1.6	–	pelitic graphitic gneiss, granite segregation pegmatite	–	adjacent to Collins Bay thrust fault
1721	Raven	Eldorado Resources Ltd.	1972	2 800	0.12	absent (eroded)	sillimanite quartzite, calcareous meta-arkose, semipelitic gneiss	0-300	–
1722	Horseshoe	Eldorado Resources Ltd.	1974	2 900	0.14	absent (eroded)	sillimanite quartzite	60-300	–
1715	Eagle Point South zone	Eldorado Resources Ltd.	1980	30 000	1.5(?)	absent (eroded)	pelitic-semipelitic gneiss (in part graphitic), quartzite, granite segregation pegmatite	0-300	in hanging wall of Collins Bay thrust fault; stratabound in quartzite and fracture fillings; subcrop below drift
1715	Eagle Point North zone	Eldorado Resources Ltd./Noranda/ SMDC	1980	20 000	2.2	absent (eroded)	pelitic-semipelitic gneiss (in part graphitic), quartzite,granite segregation pegmatite	–	in hanging wall of Collins Bay thrust fault; stratabound in quartzite and fracture fillings; subcrop below drift
1716, 1717	Dawn Lake (11, 11A, 11B and 14 zones)	SMDC/Cogema Canada/PNC/ others	1978	13 500	1.7	100	pelitic graphitic gneiss, calc-silicate, granite segregation pegmatite	30-200	mineralization extends 50 m above and 100 m below sub-Athabasca Group unconformity; no surface expression
1718, 1719	McClean Lake (North and South zones)	Canadian Occidental Petroleum/ Inco Metals Ltd./ Minatco Ltd.	1979 (North) 1980 (South)	5 400	1.5	150	pelitic graphitic gneiss, granite segregation pegmatite	115-190	mineralization extends above and below sub-Athabasca Group unconformity; no surface expression
1780	Jeb	Canadian Occidental Petroleum/ Inco Metals Ltd./ Minatco Ltd.	1982	–	–	100	pelitic graphitic gneiss	85-120	no surface expression

[1]modified from Table 7 in CIM Directory, v21, 1987, p98 (no. 246 in the reference list accompanying this report)
[2]of mineralization below surface

surface (and hence the shape of the deposit) is controlled by the rates of flow of brines through the aquifer and of fluids out of the basement.

4) Uranium-depleted fluids create the wider plume of clay alteration and quartz grain corrosion.

5) Fluid inclusion studies suggest temperatures of 150 to 225° C, pressures of 0.7 to 1.5 kb and a salinity of 30 percent NaCl, and imply an elevated geothermal gradient greater than 30° C/km (201).

The requirement of higher than clarke values of uranium in the basement is not regarded as a factor in deposit formation (146, 206).

4) Pb and Cu in the Sub-Athabasca Regolith

Values in the range 1000 to 71 000 ppm Pb and 320 to 13 500 ppm Cu, associated with anomalous concentrations of Ni and U, are reported from reverse-circulation overburden samples taken from sub-Athabasca Group regolith (SMDI Nos. 1929, 1931, 1927 and 1926). The anomalies are near the overstep edge of the Athabasca Group and may be a manifestation of the processes that formed the unconformity-type uranium mineralization, or they may represent supergene enrichments of sediment-hosted mineralization formed during pre-Athabasca weathering that developed the regolith. If they are supergene, the best potential for enrichment exists beneath the Athabasca Group where it is underlain by sediment-hosted mineralization in Wollaston Group basal pelites (unit Wpsn).

5) Uranium, Thorium and Molybdenum Mineralization in Pegmatitic Calc-Silicate Rocks and Granite Pegmatites

Uranium mineralization in pegmatitic calc-silicate rocks is found primarily in the calcareous Hidden Bay Assemblage (units Wcn, Wpr, Wms and Whq) in the southwest. It comprises uraninite disseminated in actinolite-hornblende-garnet rocks or occasionally in less iron-rich calcite-diopside-idocrase calc-silicate rocks and marbles. Chalcopyrite and molybdenite are rare accessories (SMDI Nos. 618a and 627a). Where the radioactive phase has not been identified (EXMI No. 64, SMDI No. 1714a), there is a strong possibility of Th and REE mineralization. For example, EXMI No. 64 gave anomalous total count readings on outcrop of 10 000 cps, although analysis revealed only 74 ppm U.

Sibbald et al. (256) described the general characteristics of this type of mineralization, summarized details of the comparable deposits at Burbidge Lake in the Wollaston Domain (NTS 74A) and Cup Lake in the Mudjatik Domain (NTS 74B), and interpreted them as syngenetic concentrations of uranium remobilized during metamorphism. The high phosphorus content of some Wollaston Domain examples east of Rabbit Lake was noted. Possibly similar types of occurrence are recorded at the Mary Kathleen deposit in Queensland, Australia (165, 172, 200) and in the Mont Laurier district of Quebec (272).

Granite pegmatite-hosted uranium-thorium mineralization occurs in all of the three domains, although half of the occurrences are in the Wollaston Domain and one-third in the Mudjatik Domain. The granite pegmatites are contained predominantly within the pelitic (Wpsn) and psammitic (Wrn) gneiss units in the Wollaston Domain, the pelitic gneiss unit (Mpsn) in the Mudjatik Domain and the Hudsonian granitoids (Pg, Pgp) in the Peter Lake Domain. Some occurrences are in the granitoid Archean basement.

The U/Th-bearing granitic pegmatites in pelitic-psammitic gneisses are generally accepted as the products of *in situ* anatexis and melt segregation during regional metamorphism. Their uranium content is attributed to the selective mobilization of a syngenetically derived concentration which may in turn reflect an elevated uranium content in the underlying granitic Archean basement (265, 255, 256). Uranium- and thorium-bearing granite pegmatites associated with Hudsonian granitoids are viewed as anatectic fractions derived directly from the granitic Archean basement and progressively enriched by differentiation during the Hudsonian Orogeny (255).

For some theories of Athabasca Basin unconformity deposit genesis (e.g., the multicycle process), preconcentration of uranium and thorium in pegmatites in certain lithological units and at certain lithological boundaries, such as the "Archean/Aphebian unconformity", is regarded as a significant factor.

6) Basic Igneous Plutonic-Hosted Copper, Nickel and Iron Sulphides

Five bedrock occurrences are recognized: two in layered basic-ultrabasic sills in the Peter Lake Domain (EXMI Nos. 1 and 169) and the others in the Wollaston Domain, one each in units Wbu, Wfn and Wgt.

Float occurrences are widely scattered and bear little relationship to known bedrock occurrences. The majority are found in the northeast around Charcoal Lake; two (EXMI Nos. 125 and 126) may have come from the bedrock source EXMI No. 86 or a nearby equivalent, or together with EXMI Nos. 74, 110, 101, 154 and 145 may form a glacial dispersion fan with an apex 10 to 20 km to the northeast in Manitoba.

The Peter Lake layered basic intrusions have been suggested to be similar to those in Wyoming which bear Au-Pt in addition to Cu-Ni mineralization (166, 205, 214). Analyses of up to 80 ppb Pt, 320 ppb Pd and 120 ppb Au (215) bear this out. In addition, Lacana

Mining Corporation has reported values from grab samples in the vicinity of SMDI No. 569 of up to 5.5 g/t (0.16 oz./ton) combined Pt/Pd and a 5 m trench sample returning 2.4 g/t (0.07 oz./ton) combined Pt/Pd (168, 194).

Hulbert (150) has suggested that the Peter Lake Domain has two types of platinum group metal mineralization, magmatic and hydrothermal, the latter being regarded as a redistribution and concentration of the former. The presence of graphite and low S/Se ratios which distinguish ultrabasic sulphide-bearing bodies with high PGM potential are characteristic of basic intrusions in the Peter Lake Domain (149, 150).

The small width and vast lateral extent of magmatic PGM concentrations will render them difficult to locate, especially in terrains, such as the Peter Lake Domain, that have undergone severe structural deformation and high-grade metamorphism. For example, the JM Reef in the undeformed and unmetamorphosed Stillwater Intrusion (169, 182) has taken nearly two decades to delineate and assess (268).

In the Wollaston Domain, minor copper mineralization is present in the layered Sandy Island Gabbro (SMDI No. 625). The body is of limited size (measuring 7 by 2 km) and outcrops on islands in the middle of Wollaston Lake. Syenite phases occur along the northwestern contact, suggesting that the gabbro may have alkaline affinities (13, 18).

7) Mo-Cu-U Mineralization in Late-Stage Granitic Differentiates

Nine bedrock occurrences of Mo-Cu-U mineralization are reported, five in the Wollaston Domain, three in the Mudjatik Domain and one in the Peter Lake Domain. Two (SMDI Nos. 642 and 1979) are in Hudsonian tonalites derived from supracrustal rocks, four (SMDI Nos. 624b, 630, 1978 and 1980) are in pegmatitic phases of Archean foliated granitoids (of which three are at or near the presumed Aphebian/Archean unconformity), two (EXMI No. 57, SMDI No. 1928) are in pegmatitic mobilizate in Aphebian metasediments and one (EXMI No. 77) is in a contact phase of granite-granodiorite (unit Pg).

Molybdenite occurs on its own (SMDI No. 630, EXMI No. 57), with fluorite (EXMI No. 77), with chalcopyrite, pyrrhotite and pyrite (SMDI Nos. 642 and 1928) or with unidentified primary and secondary uranium minerals (SMDI Nos. 624b, 1978, 1979 and 1980).

8) Vein-Type/Fracture-Fill Mineralization

Most occurrences lie on or near the main traces or splays of major north-trending faults related to the Tabbernor Lake System.

Over half comprise sulphides of Fe, Cu or Mo, or a combination of these, a quarter consist of graphite with or without minor amounts of Fe or Cu sulphides, and the remainder are variously represented by fluorite (EXMI No. 3), disseminations and veinlets yielding silver values (SMDI No. 637), and quartz veins containing U-Th (SMDI No. 629a) or gold mineralization (SMDI No. 616). The vein-type/fracture-fill mineralization may represent either redistribution of existing sediment-hosted mineralization or introduction of new material by hydrothermal solutions.

An episode of emplacement of northwest-trending diabase dykes, dated at between 1300 and 900 Ma (5, 142, 143), has been suggested as an important factor in the formation of the coeval sub-Athabasca unconformity uranium deposits (157). Elevated temperature gradients that accompanied intrusion are argued to have allowed free convection within the Athabasca aquifer, thus enabling dispersed ore constituents to be transported to sites of mineralization. Dyke emplacement may also have resulted in hydrothermal redistribution of sediment-hosted mineralization in the Wollaston Group.

9) Miscellaneous

Fluorite

Six fluorite occurrences are identified, of which four (SMDI No. 612b, EXMI Nos. 3, 77 and 118) are disseminations or veins in granite and granite pegmatite. The remaining two are hosted by hornblende-diopside gneiss (EXMI No. 152) and charnockite which contains minor amounts of scapolite, allanite and zircon (EXMI No. 149). The granite-hosted occurrences may have some potential (as yet uninvestigated) for Sn, Li, Be, REE and U, in view of the well-known association of these elements with fluorine-bearing granites.

Occurrences in the Hidden Bay and Charcoal Lake areas

Occurrences in the Hidden Bay area include three types: 1) the radioactive U-, Th- and phosphate-bearing arkoses, calc-arkoses and calc-silicate rocks (EXMI No. 134), 2) the vanadinite (?) occurrence (EXMI No. 41) and 3) the chalcopyrite-bearing tourmaline calc-silicate psammite (EXMI No. 34). The first indicates the unexplored potential for rare earth element mineralization in calcareous assemblages and the third provides clues which may point to a laterite-evaporite environment that possibly gave rise to continental Atacama-style borate-caliche, iron and aluminium-rich laterites (211) and shoreline sabkha-type sodium chloride and calcium sulphate evaporates. Chandler (13) and Weber et al. (271) discussed a possible evaporitic origin for the extensive scapolite calc-silicates on the northeast side of Wollaston Lake

(but see (4)). Apatite concentrations may represent phosphate derived from andesitic tuffs (208) or from the products of earlier volcanic activity possibly represented by amphibolites (unit Wms). Tourmaline concentrations are a common feature of many Proterozoic sediments (52, 53).

In the Charcoal Lake area, three occurrences (other than those of fluorite) belong to the miscellaneous category and include SMDI Nos. 646b and 646c, both of which comprise unidentified uranium and thorium minerals in radioactive* (1250 to 2000 cps) calc-silicate gneiss. Granite pegmatites associated with SMDI No. 646c are highly radioactive (15 000 cps). Occurrence SMDI No. 646b gave a total REE oxide analysis of 1.35 percent (34), suggesting that other mineralization of this type, particularly that associated with pegmatite mobilizate, may have REE potential.

Occurrence EXMI No. 143, a cancrinite- and wollastonite-bearing pegmatite, is significant because of the possible association with undersaturated syenites (25), which themselves frequently have carbonatite associations and potential for REE, niobium and tantalum mineralizations. Unit Wgt tonalite, granodiorite and monzogranite and the spatially associated unit Wcn calc-silicate rocks (which have strong coincident magnetic highs) may also have potential for this type of mineralization.

Occurrence EXMI No. 167, which consists of concentrations of zircon in quartz pebble conglomerate at the base of the Athabasca Group, probably represents a paleoplacer or heavy mineral beach sand (138). In the eastern Athabasca Basin, Ramaekers (207, 208) proposed the existence of several large northwesterly to westerly draining river systems ('deposystems') which carried sediment from a source along the Wollaston Fold Belt or areas to the southeast. These river systems and any paleoshorelines that can be identified, merit investigation for paleoplacers containing rutile, monazite and xenotime, and possibly gold.

Skarns

Alumino-silicate skarns (EXMI Nos. 170 and 171) are present at the contacts of the foliated Archean Shaganappie granitoid (unit Wfn) and as a boulder (EXMI No. 137) north of Pennycook Lake. No associated concentrations of metallic minerals have so far been reported.

Note on Precious Metal Potential

Systematic prospecting for gold or silver has not been undertaken in the area. During evaluation of base metal potential, fifteen occurrences returned trace assays for either or both metals; however, most of these values were near the limit of detection for the analytical methods (e.g., 3.4 g/t (0.1 oz./ton) Ag and 0.34 g/t (0.01 oz./ton) Au), and so may not be significant.

The three occurrences that returned significant gold and silver values and associated arsenic are: SMDI No. 616 (the Little Mossberry Island occurrence) with 4.8 g/t (0.14 oz./ton) Au and 7.5 g/t (0.22 oz./ton) Ag; SMDI No. 633a (the Partridge copper-molybdenum showing) with 0.5 to 1.0 g/t (0.015 to 0.03 oz./ton) Au and 6.8 to 8.6 g/t (0.2 to 0.25 oz./ton) Ag; and SMDI No. 617 (the Collins Bay A zone), with DDH 8-22 yielding up to 2.0 g/t (0.06 oz./ton) Au over lengths ranging from 0.3 to 2.74 m (1 to 9 feet).

Each of these three occurrences represents a different type of mineralization: SMDI No. 616 is a vein-type occurrence consisting of gold with Cu-Fe-As sulphides in quartz veins occupying a northeast-trending shear at an amphibolite-sillimanitic quartzite contact near a major north-trending fault; SMDI No. 633a is a sediment-hosted Cu-Mo sulphide occurrence; and SMDI No. 617 is an unconformity-type U-Ni-As deposit.

Structurally-controlled gold mineralization in the La Ronge and Glennie Domains is universally recognized (21, 133, 266); the Little Mossberry Island vein indicates a potential for similar gold-bearing structures in the Wollaston Domain.

Sediment-hosted Cu-Fe-Mo occurrences are widespread in the Wollaston Domain and, in some cases, contain appreciable silver (SMDI Nos. 637, 648b and 1932). SMDI No. 633a is the only sediment-hosted occurrence of those assayed in which gold is also present in appreciable amounts; it is closely associated with the Habkirk-Gallagher Lakes oxide/silicate-facies iron formation. Six other sediment-hosted Cu-Fe-Mo occurrences returned gold values at the limit of detection, indicating that these occurrences generally, and those closely associated with banded iron formation in particular, may merit further investigation.

The auriferous unconformity-type occurrence (SMDI No. 617) is similar to the gold-bearing D zone at Cluff Lake and possibly to Au-PGM-U deposits in the Nicholson-Fish Hook Bays area, which have recently been proposed as being unconformity related. The association of gold and PGM with unconformity-type uranium mineralization, possibly a geological curiosity to date, has recently been recognized as a potentially economic source of precious metals. This follows from the extraction of gold from the Cluff Lake D zone tailings, from the discovery in the Alligator River area of Australia of an extensive zone of Au-PGM mineralization at Coronation Hill (173, 174), and from identification of significant gold reserves in the Jabiluka orebody. The existence of this new type of polymetallic precious metal deposit raises questions regarding the potential of unconformity environments for economic

concentrations of precious metals. It is possible that the same conditions which led to the development of sub-Athabasca unconformity-type uranium deposits may, in other places, have created gold or base metal concentrations without uranium. Base metal concentrations do exist in places in the sub-Athabasca regolith (SMDI Nos. 1927, 1929 and 1931).

Three occurrences containing silver without gold are noted: SMDI No. 637 (Kendal Island–Cochrane River) with 3.4 to 9.6 g/t (0.1 to 0.28 oz./ton) Ag; SMDI No. 648b (Charcoal Lake) with up to 13.7 g/t (0.4 oz./ton) Ag; and SMDI No. 1932 with up to 5.5 g/t (0.16 oz./ton) Ag. None of the three contains arsenic and only one (SMDI No. 637) contains molybdenum and graphite.

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Mineral Occurrences

The abbreviations of mineral names used in this table are those standardized by the Geological Survey of Canada, with additions and alterations where necessary:

ad	andalusite	cp	chalcopyrite	mal	malachite	sca	scapolite
ala	allanite	ct	cordierite	mas	masuyite	sd	siderite
ann	annabergite	cv	covellite	mo	molybdenite	skl	sklodowskite
asp	arsenopyrite	fl	fluorite	mz	monazite	sku	skutterudite
aut	autunite	gf	graphite	nct	niccolite	sp	sphalerite
az	azurite	gn	galena	pch	pitchblende	tl	tourmaline
bo	bornite	gsd	gersdorffite	po	pyrrhotite	u	uranium minerals (unidentified)
bvo	bravoite	gum	gummite	pow	powellite		
bwo	boltwoodite	hem	hematite	prm	pararammelsbergite	uph	uranophane
ca	calcite	il	ilmenite	py	pyrite	ur	uraninite
can	cancrinite	kas	kasolite	ra	radioactive minerals (unidentified)	va	vanadinite
cof	coffinite	lm	limonite	rm	rammelsbergite	vs	vesuvianite
cor	corundum	ma	marcasite	saf	safflorite	wo	wollastonite
cbo	carbonate	mag	magnetite			zr	zircon

Other abbreviations used:

CR	Crown Reserve	tr	trace

Mineral Occurrences Identified in SMDI File

SMDI No.	Elements Present	Name of Occurrence/ General Location	NTS 64L-	Minerals Present	Host Rock/ Structures and Remarks	Reference Numbers
612a	Cu (Mo, Pb, As, Fe, Zn, C, Au)	Heinz Lake, CR No. 619	02	py, po, asp, cp, ma, sp, gn, mo, gf	2 to 4% and as much as 10% sulphides in quartzite, meta-arkose, biotite gneiss outcrop and frostheave, coinciding with prominent airborne conductors	59, 171, 202, 204
				hem, mag, il, gf	in shears	
612b	Fe (Cu, Zn, C, Ti, As, F)	south end of Hydichuk Lake	02	py, ma, asp, cp, po, mag, il, gf, sp	tr to 10% disseminated sulphides and oxides in metaconglomerate, biotite quartzite, arkosic quartzite, meta-arkose and hornblende granulite boulders, over prominent airborne EM anomaly group	204, 218
				fl	in granitic pegmatite and biotite granite boulders	
612c	Zn (Fe, C)	3 km south-south-east of south end of Heinz Lake	02	py, po, gf, sp	disseminated sulphides and up to 20% gf in white and grey quartzite frostheave and outcrop in belt of prominent airborne EM anomalies	202, 204, 247, 248, 249
613	Mo (Zn, Pb, Fe, Au)	Reitenbach Lake, CR No. 619	02	py, po, sp, gn, mo, cbo	up to 2% sulphides in greenish metaquartzite, frostheave and outcrop	59, 171, 202, 204
				hem, il, mag, gf	in shears	
616	Au (Ag, As, Cu)	Little Mossberry, east of Parker Island	04	py, asp	shear containing 2% sulphides, quartz veins through gneissic meta-quartzites, amphibolites; 4.8 g/t (0.14 oz./ton) Au and 7.5 g/t (0.22 oz./ton) Ag in grab samples	59, 171, 202, 223, 269 (map 137A), 59, 171

SMDI No.	Elements Present	Name of Occurrence/ General Location	NTS 64L-	Minerals Present	Host Rock/ Structures and Remarks	Reference Numbers
617	U (Ni, As, Pb, Fe, Au)	Collins Bay A zone, Harrison Peninsula	05	pch, rm, prm, gn, py, nct, kas, cof, gn, po, gf, asp	disseminations and fracture-fillings in overburden, highly altered pelitic graphitic gneiss, quartzofeldspathic gneiss and pegmatite bedrock along subcrop of thrust fault; 2 m interval of 5 to 30% gn (11.5% Pb, 0.72% Ni, 0.2% U_3O_8) as octahedral crystals, up to 3 m sections of massive pch disseminations and fracture-fillings (2.08 to 13.51% Ni and up to 56.3% U_3O_8); 2.0 g/t (0.06 oz./ton) Au over 0.3 to 2.74 m lengths in drill core assays	65, 66, 67, 68, 69, 139, 147, 152, 259
618a	U	Ivison Bay, Harrison Peninsula	05	pch	blebs in fractures in calc-silicate rock	69, 70, 71, 72, 213, 257 (p111-123)
618b	Mo (Cu, Fe)	Ivison Bay, Harrison Peninsula	05	mo, py, po, cp	biotite paragneiss, calc-silicate	
620	U (C, Fe, Cu)	Cunning Bay	05	ra, po, gf, py, cp	disseminated in grey and pink pegmatite, schistose garnetiferous paragneiss, graphitic pelite up to 50% py and 20% gf; associated prominent ground EM conductors	66, 67, 69, 73, 74, 75, 76, 77
621	U (Au, Ni, Co, As, Pb, Cu, Fe, C)	Collins Bay B zone; Collins Bay D zone	05	pch, cof, gsd, nct, sku, gn, cp, py, ca, gf	intergranular fillings and dustings on grain boundaries; in footwall of thrust zone in Athabasca sandstone and basement slivers in thrust	65, 66, 67, 68, 69, 139, 145, 147, 151, 152, 260
622	Cu	Dransfield Island	06	cp	veins and veinlets in shear zone in biotite gneiss and quartzite	50, 51, 59, 78, 79, 80, 224
623a	Cu (Fe, C)	Greenway Island	06	cp, py, po, gf	disseminated in biotite paragneiss	59, 78, 79, 80, 81, 82
623b	C (Fe, Cu)	Central Snowshoe Island	06	gf, py, cp	disseminated and in shears in biotite paragneiss near major thrust fault	79, 80
624a	Cu (Fe, C)	north shore of Fife Island	06	cp, py, mag, gf	fractures in hornblende gneiss interbanded with meta-arkose cut by pegmatite and quartz veins	59, 83, 84, 85
624b	U (Mo)	north shore of Fife Island	06	mo, u	migmatitic boulders of pegmatite biotite paragneiss, and meta-arkose, reading up to 7000 cps	82, 84
624c	Fe	southern tip of Fife Island	06	py, po	up to 10% disseminated in felsic metavolcanics (meta-tuff and pyroclastics)	78
625	Cu (Fe, Mo)	Sandy Island	06	mal, py, mo	shears in layered differentiated basic intrusive in Aphebian metasediments; py and mo in calc-silicate xenolith	14, 78, 81, 180
626	U (Mo)	trench no. 1, north-east end of Spurjack (Ellies) Island	06	ur, mo, u (secondary)	disseminations in biotite paragneiss, calc-silicate rock and meta-arkose	59, 78, 79, 80, 81
627a	U (Cu, Mo)	trench no 2, north-east end of Spurjack (Ellies) Island	06	ur, u (secondary), cp, mo	pod of hornblende actinolite containing 5 to 10% ur; secondary uranium mineral on fractures	59, 78, 79, 80, 81
627b	U	central Spurjack (Ellies) Island	06	ur	in pegmatite in quartzite	59, 78, 79, 80, 81

SMDI No.	Elements Present	Name of Occurrence/ General Location	NTS 64L-	Minerals Present	Host Rock/ Structures and Remarks	Reference Numbers
627c	Fe	small island 1 km south of south end of Spurjack (Ellies) Island	06	py, po	biotite paragneiss	59, 78, 79, 80, 81
628a	U (Th, Mo Fe)	Cleveland Island	06	gum, u (secondary), py, mo	intergranular; on fractures in pegmatite	50, 51, 59
628b	U	south end of Cleveland Island	06	u (secondary)	on radioactive boulders (type not stated)	41, 50, 51
629a	U (Th, Fe)	Gillies Island	06	ur?, mz?, zr?, py, mag, gum	in quartz veins in biotite pegmatite	50, 51, 59
629b	Mo (Fe, C, Ti)	south end of Gillies Island	06	py, gf, mo, il, mag, po	disseminated and in shears in biotite paragneiss and pegmatite boulder and bedrock; associated prominent ground EM conductor	79, 80
630	Mo	Shaganappie Island, CR No. 619	07	mo	pegmatite in granite	59, 202, 224
631a	Cu (Fe, Ni, As, Zn, Pb, C)	Ooms Lake, CR No. 619	08	py, po, asp, cp, sp, gn, ma, hem, gf	5 to 30% sulphides disseminated in metaquartzite outcrop and boulders	55, 56, 57, 176, 177, 178, 202
631b	Fe (C, Mo)	6 km west of southeast end of Waspison Lake	09	py, po, gf, mo	up to 15% sulphides and 70% graphite disseminated and as blebs and stringers in bedrock granite gneiss and chlorite-feldspar gneiss with associated granite pegmatite; po and mo in grey quartzite outcrop and float; associated prominent airborne EM conductors	164, 177, 202, 225
632a	Cu (Fe, C)	west shore, central Sava Lake	09	cp, py, po, mag, gf, unidentified black sub-metallic mineral	up to 45% gf, 5% sulphides and 2% magnetite disseminated in biotite gneiss, quartzite, calc-silicate and granite gneiss bedrock outcrop and frostheave; associated prominent airborne EM conductors	27, 28, 32, 61, 62, 202
632b	Th (U) Fe	east shore, central Sava Lake	09	u, unidentified Th minerals, po	granite outcrop analyses up to 0.04% U_3O_8 and 1.02% ThO_2 with reading of 4000 cps; white quartzite float containing disseminated sulphide; associated prominent airborne EM conductors	28, 32, 61, 154, 164, 202
632c	Fe	2 km northeast of north tip of Anderson Lake	09	po	up to 5% disseminated in grey quartzite boulder	27, 32, 164, 202
633a	Cu (Mo, Fe, As, C, Au, Ag)	Partridge copper-molybdenum showing; 3 km south of Habkirk Lake	10	po, cp, mo, py, mag, asp, gf	disseminated and in fractures and chlorite-coated slips in white and cherty calcareous and arkosic quartzites, quartz hornblende gneiss, greywacke and biotite gneiss bedrock, outcrop, frostheave and float; grab sample analyses of up to 0.58% Cu and 0.66% MoS_2; up to 0.5 g/t (0.015 oz./ton) Au and 8.6 g/t (0.25 oz./ton) Ag in chip samples; associated prominent airborne EM conductors	27, 28, 29, 32, 154, 202, 220, 221
633b	Cu (Mo, Fe, C)	2 km west of central Rupert Lake and 5 km southwest of main showing	10	py, po, mo, cp, gf	up to 60% gf, 10% sulphides in biotite schist bedrock and quartzite outcrop; associated airborne EM conductor	28, 164, 202, 220

SMDI No.	Elements Present	Name of Occurrence/ General Location	NTS 64L-	Minerals Present	Host Rock/ Structures and Remarks	Reference Numbers
633c	Cu (Mo, Fe)	2 km east of central Habkirk Lake and 5 km northeast of main showing	10	po, py, mo, cp	up to 10% sulphides disseminated in quartzite outcrop and float; associated airborne EM conductors	28, 32, 202
633d	Fe (Cu)	southeast corner of Kinsman Lake	09	py, po, cp	disseminated in quartzite float; associated prominent airborne EM conductors	27, 32, 164, 202
634	Cu (Fe, C)	Bear claim block, Lawton Lake	10	cp, py, po, gf	disseminated in hornblende gneiss, shattered calc-silicate; sheared and mylonitic hornblende biotite gneiss; up to 35% gf in shears and 10% disseminated	27, 28, 29, 32, 59, 220, 221
635a	Cu (Fe, C, Zn)	Deception Bay, Wollaston Lake	10	py, po, cp, gf	hornblende-biotite-garnet schist and gneiss, minor quartzite and meta-arkose, quartz-biotite-graphite schist containing up to 50% sulphides (probably iron formation); associated prominent airborne and ground EM conductors and coincident ground magnetic anomalies	27, 28, 32, 59, 220, 221
635b	Fe (C, Cu)	Richardson Bay	07	py, po, gf, cp mag	disseminated in biotite-garnet paragneiss outcrops in area of multiple airborne EM anomalies and intense magnetic anomaly; locally up to 60% graphite; lean oxide-facies iron formation	13, 14, 27, 28, 220
635c	Fe	Deception Bay	10	py, po	disseminated in biotite gneiss outcrop; associated prominent airborne EM conductors and coincident ground magnetic anomaly	27, 42
635d	Fe	small islands off southern tip of Keeler peninsula	10	po	disseminated in calc-silicate gneiss; associated prominent airborne EM conductors	27, 28, 32, 220, 221
636a	Cu (Zn, Fe)	Wellbelove Bay	10	mag, cp, po, py	pegmatite, biotite-garnet gneiss, quartzite, calc-silicate gneiss and amphibolitic garnet gneiss containing up to 80% mag, 20% po, 25% py and trace cp; maximum analyses 0.19% Cu and 0.02% Zn (probably iron formation)	27, 28, 32, 59, 220, 221
636b	U (Th)	central Usam Island	10	u (secondary-yellow), unidentified Th minerals	pink and buff pegmatite boulders; analyses of 0.04% U_3O_8 and 0.09% ThO_2	27, 28, 32, 220, 221
636c	U (Th)	northern peninsula of Usam Island	10	u	pink and buff pegmatite boulders; analyses of 0.01% U_3O_8 and 0.01% ThO_2	27, 28, 32, 49, 220, 221
636d	Cu (Fe)	northern peninsula of Usam Island	10	po, py, cp	disseminated in quartzite outcrop and boulders	27, 28, 32, 49, 220, 221
636e	Cu (Fe)	northwest shore of Usam Island	11	cp, po	disseminated in quartzite outcrop; associated prominent airborne EM conductors	32, 42, 224
637	Ag (Zn, Pb, Mo, C)	2 km northeast of Kendel Island, Cochrane River	11	mo, unidentified Ag minerals	disseminated in graphitic granodiorite or in veinlets; analyses up to 9.6 g/t (0.28 oz./ton) Ag and 0.12% Zn in schistose garnet-bearing gossaned zones	59, 224

SMDI No.	Elements Present	Name of Occurrence/ General Location	NTS 64L-	Minerals Present	Host Rock/ Structures and Remarks	Reference Numbers
638	Mo	west shore of Killock Bay	11	mo	highly granitized metasediments; mo in joints in granitic gneiss	59, 83, 84, 85
639a	U	Scrimes Lake	11	ur, u (secondary)	biotite stringers and segregations in pegmatite	27, 59, 83, 84, 85, 86
639b	U	9 km south of northeast end of Scrimes Lake	11	u	pegmatite boulders in radiometrically anomalous area of foliated granite reading up to 9000 cps	11, 42
639c	U (Th)	south shore of Scrimes Lake	11	py, u (secondary), gf	readings to 10 000 cps; spectrometer analyses of 1.0% U_3O_8 and 0.3% ThO_2 in pegmatite; sulphides disseminated in meta-arkose and schist	11, 85, 89
640	U (Th, Cu, Fe)	Garnet Lake prospect, CR No. 618	12	uph, gum, ur, cp, py, gf	biotite-garnet-quartz-potash feldspar pegmatites; in fractures and along grain boundaries in biotite-rich areas; ur and sulphides in graphitic pelites; associated airborne radiometric high	59, 87, 88, 89, 213
641a	U (Th)	Bigstone Rapids	15	u (secondary-yellow), unidentified Th minerals	in white pegmatite sill, calc-silicate bedrock; analyses up to 0.27% U_3O_8, 0.06% ThO_2; reading up to 4000 cps	28, 30, 32, 33, 59
641b	Fe (Zn, Cu, C)	5 km east of north end of Burrill Bay	15	gf, py, po, cp	up to 5% sulphides and 30% gf disseminated in calcareous biotite gneiss, calc-silicate gneiss and biotite schist bedrock; associated prominent airborne EM conductors and coincident ground magnetic anomalies	28, 30, 33, 49, 106
641c	U (Th)	north shore of Burrill Bay	15	u (secondary)	garnetiferous pink pegmatite reading up to 4100 cps; analyses up to 0.68% U_3O_8 and 0.12% ThO_2	32, 33, 49
641d	Fe (C)	4 km north of north end of Bannock Lake	15	py, po, gf	up to 10% sulphides and 10% gf disseminated in biotite-garnet gneiss bedrock; associated airborne EM conductor and coincident ground magnetic anomaly	33
641e	Cu	3 km east of north end of Burrill Bay	15	cp	pegmatite	28, 30, 32, 33, 106
641f	Cu	4 km south-south-east of north end of Burrill Bay	15	cp	foliated granite	28, 30, 32, 33, 106
641g	Cu	6 km south-south-east of north end of Burrill Bay	10	cp	hornblende gneiss	28, 30, 32, 33
642	Cu (Mo, Fe)	south of Matthews Bay, Charcoal Lake	16	po, cp, mo	disseminated in lenses of hornblende gneiss in granite	28, 32, 59, 61, 62, 202
643	Cu (Fe)	north of Matthews Bay, Charcoal Lake	16	po, cp	disseminated in lenses of hornblende gneiss in granite	27, 28, 32, 59, 61, 62, 171, 202, 252 (map 144A)
644a	Cu (Fe)	Caribou Rapids, Cochrane River	16	py, cp	disseminated in arkose	27, 28, 31, 32, 34, 59, 171, 252
644b	Fe	1 km west of Caribou Rapids	16	py	disseminated in hornblende gneiss outcrop	27, 28, 31, 32, 34
645a	Cu (Fe)	Matthews Bay, Charcoal Lake	16	po, cp, py	lenses of hornblende gneiss in granite	27, 28, 32, 61, 62, 59, 171, 252

SMDI No.	Elements Present	Name of Occurrence/ General Location	NTS 64L-	Minerals Present	Host Rock/ Structures and Remarks	Reference Numbers
645b	Th (U)	east shore of Matthews Bay, Charcoal Lake	16	u, unidentified Th minerals	pegmatite outcrop reading up to 2000 cps; analysis 0.02% U_3O_8 and 0.68% ThO_2	27, 32, 202
646a	Cu (Fe)	Johnston Lake	16	py, cp	disseminated in biotite-actinolite rock in shear at contact with metagabbro dyke	27, 28, 31, 32, 34, 59, 171, 252
646b	U (Th, REE)	north shore of Johnston Lake	16	u, unidentified Th minerals	boulder of calc-silicate gneiss reading 2000 cps; analysis 0.12% U_3O_8, 0.03% ThO_2 and up to 1.35% REE	27, 28, 31, 32, 34, 254
646c	U (Th)	1 km south of southwest end of Kalheim Lake	16	u, unidentified Th minerals	boulder of calc-silicate gneiss reading 1250 cps; analysis 0.04% U_3O_8 and 0.01% ThO_2; associated ground EM conductor and sub-parallel magnetic anomaly	32, 254
	U (Th)?		16	ra	outcrop of pegmatite reading 15 000 cps	
646d	Fe	2 km west-southwest of southwest end of Kalheim Lake	16	po	disseminated in boulder of calc-silicate rock	27, 28, 31, 32, 34
647	Cu (Fe, C)	Daschuk Lake	16	gf, py, cp	disseminated in biotite-cordierite gneiss; associated prominent airborne and ground EM conductor swarms and coincident ground magnetic anomaly	27, 28, 32, 59, 61, 62, 202, 252
648a	Cu (Fe)	"Limonite Lake"[1]	16	py po	quartzitic biotite gneiss bedrock containing 10 to 20% sulphides; crosscutting pegmatites	27, 28, 32, 59, 61, 62, 171, 202, 252
648b	Cu (Zn, Fe, Ti, Ag)	east shore, north end of Charcoal Lake	16	po, cp, sp mag, il	disseminated in quartzite and biotite quartzite float, up to 6% sulphides, 10% mag; associated prominent airborne EM conductor; analyses up to 0.2% Cu, 13.7 g/t (0.4 oz./ton) Ag and 0.5% Zn	2, 27, 32, 202
648c	Fe (Cu, Ag)	east shore, north end of Charcoal Lake	16	mag, po, py	diopsidic quartzite, quartzite and glassy quartzite float and boulders containing up to 10% disseminated sulphides; analyses up to 0.08% Cu, 3.4 g/t (0.1 oz./ton) Ag; associated prominent airborne EM conductor	2, 27, 32, 202
648d	Fe (Ti, Cu, Zn, C)	east shore, north end of Charcoal Lake	16	il, mag, po, cp, sp, gf	up to 30% sulphides and 35% il disseminated in quartzite outcrop, frostheave and float; probable iron formation; analysis 0.12% Cu; associated prominent airborne EM conductor	2, 27, 32, 202
649	Fe (Cu, Ni)	Cochrane Rapids	16	po	calc-silicate rock containing 10% disseminated sulphides	27, 28, 31, 32, 34, 59, 171, 252
650	Fe	southwest of Miller Lake	16	py	disseminated in calcareous quartzite	27, 28, 31, 32, 34, 59, 171, 252
1713	U	Rabbit Lake Mine	04	pch, bwo, skl, mas, uph	in plagioclasites, carbonates, calc-silicate rocks, feldspathic gneiss at sub-Athabasca unconformity next to major fault; deposit now mined out	23, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 139 (p88), 140, 141, 142, 158, 190, 203, 213, 217, 257, 258, 259, 261

[1]local name

SMDI No.	Elements Present	Name of Occurrence/ General Location	NTS 64L-	Minerals Present	Host Rock/ Structures and Remarks	Reference Numbers
1714a	U	Pow Bay prospect	04	u	in actinolite-rich garnetiferous mafic rocks	91
1714b	Cu (Au, Ag)	Pow Bay prospect	04	cp, az	disseminated in and staining grey quartzite outcrop and boulders	269
1715	U	Eagle Point	05	u (primary and secondary)	associated with quartzites in and between major shear zones	48, 64, 107, 108, 147, 188, 261
1716	U (Co, Ni, As, Cu)	Dawn Lake 11, 11A and 11B zones	05	pch, cof, u (secondary-yellow)	in clay-filled fractures cutting Athabasca sandstone and regolith; in pelite, semipelite, calc-silicate schists or gneisses and impure marbles (basement Aphebian); as blebs and bands along foliation, in cross fractures and as sooty disseminations	15, 184, 186, 187, 189, 192, 195, 261
1717	U (Co, Ni, As, Cu)	Dawn Lake 14 zone	05	pch, cof, u (secondary-yellow)	in clay-filled fractures in Athabasca sandstone and regolith at or near the unconformity	15, 184, 186, 187, 189, 192, 195, 261
1718	U (Ni, Co, As)	McClean North	05	nickel, cobalt, arsenic sulphides, u	in fractures, altered Athabasca sandstone and regolith at or near the unconformity	7, 39, 40, 63, 185, 191, 226, 261, 264, 270
1719	U (Ni, Co, As)	McClean South	05	four facies: sulphide (bvo, py, cof, ur, cp, sd); arsenide; bleached; oxide (prm, nct, gsd, As, saf, hem, goe)	interstitial in Athabasca sandstone predominantly in regolith, also in Athabasca sandstone	7, 39, 40, 63, 185, 191, 226, 261, 264, 270
1721	U	Raven	04	pch	disseminated in paragneiss and quartzite below unconformity; associated hematization, sericitization and kaolinization	261
1722	U	Horseshoe	04	pch	disseminated in paragneiss and quartzite; associated hematization, sericitization and kaolinization	261
1724	U (Fe, C)	Kewen–Lampin Lakes area	04	pch, py, gf, hem	in shear, breccia and fracture zones in meta-arkose, quartzite, marble, calc-silicate and pegmatite bedrock; in boulders of green feldspar rock (syenite?); assaying up to 0.15% U_3O_8 and 0.2% ThO_2; associated EM conductor swarm	105
1780	U	'JEB' deposit	05	u	not stated	183, 193, 261, 267
1857	U	8 km east of Mullen Lake on east shore of Choker Lake	01	u (secondary-yellow)	boulders of pegmatite, hornblende pegmatite, felsic gneiss; analyses up to 6650 ppm U; readings up to 10 000 cps	247, 249
1858	U	2 km northwest of Mullen Lake	01	u	boulders of felsic and mafic gneiss; analyses up to 2320 ppm U	232, 247, 249
1887	U	southeast shore of Ahenakew Lake	04	pch, cof, aut	up to 0.75% U_3O_8 in plagioclasite or calc-silicate in assemblage of amphibolites, calc-silicates, meta-arkose, quartzite and marble beneath Athabasca unconformity; local chloritization and considerable hematization	109, 110

SMDI No.	Elements Present	Name of Occurrence/ General Location	NTS 64L-	Minerals Present	Host Rock/ Structures and Remarks	Reference Numbers
1900	U (Ni, Fe, Cu, C)	west of central Ahenakew Lake	04	py, gf, hem, u, lm, cp	disseminated on fractures and in meta-argillite, chlorite paragneiss, chloritic pelite and graphitic schists beneath Athabasca unconformity; associated prominent ground EM conductor swarm; hematite and clay alteration	93, 111, 112, 113, 114
1901	U (Cu, Fe, C, Ni)	west of central Ahenakew Lake	04	py, cp, lm, hem, gf, pch	in fractures and disseminated in pegmatite, quartzite, biotite gneiss, chlorite paragneiss; hematite, chlorite and limonite alteration; associated prominent ground EM conductors	93, 111, 112, 113, 114
1902	U (C, Fe)	2 km east of north end of Ahenakew Lake	04	pch, gf, py, hem	disseminated and fracture-bound in meta-arkose with pegmatite veining, chlorite and biotite paragneiss; chloritization and hematization; associated prominent ground EM conductor swarm; up to 400 ppm Pb in deep overburden samples	104, 111, 114
1904	U	small island in Otter Bay, 2 km east of south end of Black Island	04	pch	1 cm diameter 'spot' of pitchblende-like mineral in coarse-grained pale grey calcite-diopside-idocrase marble associated with dark green diopside-calcite calc-silicate rocks and calcareous meta-arkose; maximum reading 10 000 cps	42, 54, 269
1917	U (Pb)	northwest shore of Johnston Lake	16	u, unidentified Pb minerals	boulders of diopside-rich calc-silicate, white pegmatite, biotite gneiss and quartzite reading to 10 000 cps and analyses up to 0.17% U and 0.4% Pb	27, 28, 31, 32, 35, 56, 227, 228, 252, 254
1918	U (Mo, Pb, Fe, Cu)	"Limonite Lake"[1], 10 km north of central Charcoal Lake	16	uph, mo, py, po, cp, pch, ur, hem	bedrock and boulders of plagioclasite, calc-silicate gneiss, pegmatite, migmatite, amphibolite, pelitic biotite gneiss, psammitic biotite gneiss, quartzite and meta-arkose reading 10 000 cps; analyses up to 0.68% U_3O_8 and 3000 ppm Pb; associated prominent airborne EM conductors	1, 2, 3, 27, 28, 32, 61, 62, 252
1922	U (Mo, Pb)	1 km west of west end of Kalheim Lake	16	ur	disseminated in calc-silicate gneiss boulder; analysis 0.157% U, 600 ppm Pb and 640 ppm Mo; reading up to 500 cps	27, 28, 31, 32, 34, 35, 228, 252, 254
1923	U (Mo, Pb)	north shore of Johnston Lake	16	u (secondary-yellow), ur	quartzofeldspathic gneiss boulder reading up to 12 000 cps; analysis 0.386% U, 0.11% Pb and 0.16% Mo	27, 28, 31, 32, 34, 228, 252, 254
1924	U	4 km east of north end of Wagner Lake	02	mag, hem	in radioactive pegmatite and quartzite boulders and outcrop (max. 3083 ppm U) coinciding with prominent airborne radiometric anomalies	247, 249
1925	U	5 km southeast of south end of Reitenbach Lake	02	u (secondary-orange and yellow)	radioactive red pegmatite outcrop and boulders in area of airborne radiometric high; maximum of 10 000 cps and 895 ppm U)	247, 249

[1]local name

SMDI No.	Elements Present	Name of Occurrence/ General Location	NTS 64L-	Minerals Present	Host Rock/ Structures and Remarks	Reference Numbers
1926	U	2 km north of the mouth of the Umpherville River	04	not identified	in pegmatite boulders reading up to 1500 cps; deep overburden sample analysis of 1400 ppm U, and chlorite paragneiss bedrock drill core analyses of 0.025 to 0.03% U_3O_8	90, 93, 100, 101, 108
1927	Cu (Pb)	2 km southwest of Rabbit Lake Mine	04	not stated	deep overburden sample which may represent supergene enrichment of copper in regolith over Aphebian quartzites and arkoses bearing Cu, Pb and other sulphide mineralization (13 500 ppm Cu, 2280 ppm Pb)	90, 93, 108, 115, 116, 117
1928	U (Mo, Cu, Fe, P)	"Stans Lake"[1] grid, south end of Hidden Bay	04	py, po, cp, u	up to 2% sulphides and 0.24% U_3O_8, 6.21% P_2O_5 and 0.03% Mo in pegmatite, calc-silicate, feldspathic quartzite boulders and bedrock reading 2000 cps and greater; associated ground EM conductors	118, 119, 120
1929	U	Umpherville River, 3 km west of Hidden Bay	04	u	disseminated in radioactive pegmatite boulders reading up to 2100 cps	90, 104, 120
	Pb				deep overburden samples containing 1000 ppm and 71 000 ppm Pb may indicate supergene concentration of lead mineralization in meta-arkose and quartzite bedrock	
1931	U	1 km east of Lampin Lake	04	not identified	up to 0.07% U_3O_8 in boulders of biotite pegmatite reading up to 4000 cps	92, 94, 108, 115, 121
	Cu (Pb)				deep overburden drilling sample gave analyses of 320 to 470 ppm Cu and up to 1050 ppm Pb	
1932	Cu (Ag, Fe)	shore of Wollaston Lake, 3 km north of centre of Black Island	04	cp, hem	specular hematite disseminations and coatings, and disseminated sulphide in metaquartzite, joints and fractures in outcrop on prominent fault line; up to 0.76% Cu and 5.5 g/t (0.16 oz./ton) Ag in assays	90, 93, 94, 269
1933	U	3 km north-north-east of mouth of Fond-du-Lac River	05	u	up to 0.54% U_3O_8 in boulders of pegmatite	11, 43
1934	U	northwest shore of Cunning Bay	05	u	disseminated in granite and meta-arkose, schist and Athabasca sandstone boulders reading up to 5500 cps; maximum analyses 0.8% U_3O_8 and 0.38% ThO_2	42, 122, 123
1935a	C	island west of north end of Harrison Island	05	gf, py	up to 95% gf in schist among meta-arkose gneiss, granodiorite gneiss and metagreywacke beneath Athabasca unconformity and regolith and up to 3% py disseminated and as fracture fill; massive graphite seams parallel to foliation	42, 44, 70, 180
1935b	Cu (Fe)	channel between Harrison Island and island to the west	05	cp, py	in quartz veins and fractures in coarse-grained biotite granite and quartz-biotite gneiss bedrock beneath Athabasca unconformity and regolith	42, 44, 70, 180

[1]local name

SMDI No.	Elements Present	Name of Occurrence/ General Location	NTS 64L-	Minerals Present	Host Rock/ Structures and Remarks	Reference Numbers
1936	U (Th, Fe)	island west of north end of Harrison Island	05	u (secondary), py	disseminated in and staining quartzite boulders reading up to 5000 cps; analyses up to 0.54% U_3O_8 and 0.017 ThO_2	44
1937	Cu (Ag, Fe, C, Au)	central Harrison Island and on opposite shore to northwest	05	py, gf, po	disseminated in boulder of calc-silicate, po in boulders of quartzite; analysis of calc-silicate gave 0.34 g/t (0.01 oz./ton) Au and 3.4 g/t (0.10 oz./ton) Ag	202
1938	U (C, Fe)	5 km northeast of Torwalt Lake	05	u, hem, py, gf	up to 25% gf in semipelite succession separating two arkosic units; marble below graphitic horizons; patchy discontinuous uranium mineralization in hematized basal Athabasca conglomerates, segregation pegmatites, graphitic metasediments and in regolith; quartz chalcedony boxwork veins; significant and continuous in intensely fractured, chloritized and hematized semipelite; maximum analysis 0.08% U_3O_8	8, 9, 10, 66
1939	Fe (Ni, Cu)	2 km north-northeast of north end of Kinsman Lake	09	po, lm	up to 15% disseminated in white quartzite frost heave in gossan zone	27, 32, 164, 202
1940	Fe (Cu)	1 km northwest of central Gibson Lake	09	mag, po, cp	up to 10% magnetite, 7% sulphides and 10% garnet in dioritic boulder; possibly iron formation	27, 32, 164, 202
1941	Th (U)	3 km east-northeast of north end of Watson Lake	10	u, unidentified Th minerals	quartzose biotite gneiss reading 1500 cps; analysis 0.72% U_3O_8 and 1.98% ThO_2; associated prominent and extensive ground EM conductor swarm and radiometric anomaly	27, 32, 49, 155, 156, 229
1942a & b	U (Ni, Fe, C)	2 km southwest of southwest tip of Tromburg Bay	12	gf, py, u	altered Athabasca sandstone and paragneiss; analyses up to 0.065% U_3O_8 over 5 m, 0.16% U_3O_8 over 1 m and 0.35% Ni over 0.6 m; associated ground EM conductor swarm	75, 77, 107, 124
1943	U (Th)	8 km southeast of Flett Rapids on Fond-du-Lac River	13	u, unidentified Th minerals, u (secondary-yellow)	granite boulders and outcrop reading up to 5000 cps; analyses up to 9230 ppm U and 918 ppm Th; associated airborne radiometric anomaly and magnetic low	177, 230, 231
1944	U	7 km southwest of central Bentley Lake	14	hem, u (secondary-yellow)	salmon-pink biotite-quartz-feldspar ±garnet pegmatite boulders with quartz stringers, staining on fractures; reading up to 9000 cps, analyses up to 1750 ppm U_3O_8; associated airborne EM anomaly	11, 12, 87, 88
1945	U	7 km east of central Burrill Bay on Cochrane River	15	u	foliated granite/feldspar gneiss outcrop reading 4000 cps; analyses up to 0.28% U_3O_8	49, 106
1946	U	1 km east of Haglund Lake	01	u	boulders of pegmatite; analyses up to 503 ppm, readings up to 5000 cps	247
1947	U	3 km south-southeast of Dauk Lake	01	u	outcrop of pegmatite reading up to 4200 cps; analysis 7575 ppm U	232, 247
1948	U	southwest shore of Roberts Lake	01	u	boulders of pegmatite; analyses up to 1348 ppm U	232, 247, 249

SMDI No.	Elements Present	Name of Occurrence/ General Location	NTS 64L-	Minerals Present	Host Rock/ Structures and Remarks	Reference Numbers
1949	U	Hull–Mullen Lakes area	01	u	felsic gneiss boulder; analyses up to 3500 ppm U	232
1950	U (Cu, Ni, Pb)	3 km southwest of Rabbit Lake Mine	04	not stated	867 ppm U, 1000 ppm Cu, 800 ppm Ni, 750 ppm Pb, in deep overburden samples and sub-Athabasca regolith; disseminated sulphides in graphitic pelite bedrock; uranium mineralization in white sandstone bedrock	90, 93, 108, 115, 116, 117
				u (secondary)	secondary uranium stain on radioactive pegmatite, meta-arkose and quartzite boulders reading up to 2000 cps; probable regolithic concentration of bedrock mineralization	
1951	U (Fe, Ti)	5 km west-southwest of Lawton Lake	10	il, u	pegmatite and calc-silicate; maximum reading 28 000 cps, maximum analysis 0.183% U_3O_8	154, 155, 249
1952	U	3 km south of central Gallagher Lake	10	u	biotite gneiss boulder containing up to 5% sulphides and 10% magnetite; readings of 5500 cps, analysis of 2440 ppm U_3O_8	154, 155, 202
1953	U (Th)	7 km north-northeast of north end of Watson Lake	10	yellow u, unidentified Th minerals	pegmatite boulders reading up to 12 500 cps, analyses up to 0.388% U_3O_8 and 0.32% ThO_2; associated prominent and extensive ground EM conductor swarm	154, 155, 156, 233, 234
1954	U	6 km south of southeast end of Waspison Lake	09	u	up to 0.133% U_3O_8 in white pegmatite boulder reading 3100 cps; associated prominent ground EM conductor swarm	155, 156, 164, 202
1955	U	south shore of Burrill Bay	15	u	boulder of white pegmatite; analysis 0.073% U_3O_8	49
1956	U	north shore of Burrill Bay	15	u	boulder of feldspar-rich pegmatite; analysis of 1560 ppm U	49, 106
1957	U	1 km southwest of south end of Watson Lake	10	u	angular granodiorite boulder; maximum analysis 0.159% U_3O_8	27, 28, 49
1978	U (Mo, Fe, C)	3 km north of north end of Manson Lake	11	u (secondary–yellow), py, po, mo, gf	disseminated and in fractures in alaskite, quartz-biotite gneiss, meta-arkose, and pegmatite bedrock and boulders; up to 30% sulphides, local bands of massive sulphide (90%); analyses up to 9752 ppm U and 1743 ppm Mo; 1700 cps maximum reading	235, 236, 253
1979	U (Mo)	north shore of Scrimes Lake	11	u, mo, u (secondary)	white and pink granite pegmatite and paragneiss boulders and bedrock reading up to 6000 cps; analyses up to 5000 ppm U_3O_8 and 6700 ppm MoS_2; 300 m long by 20 to 70 m wide boulder train trending 015°	11
1980	U (Mo)	southeast Tromburg Bay	12	u (secondary), mo	pegmatite boulders and bedrock; associated prominent airborne magnetic high, radiometric anomaly and ground EM conductors; readings up to 4000 cps, analyses up to 7140 ppm U_3O_8 and 2000 ppm MoS_2; 300 m long by 100 m wide boulder train	11, 12, 65, 127

SMDI No.	Elements Present	Name of Occurrence/ General Location	NTS 64L-	Minerals Present	Host Rock/ Structures and Remarks	Reference Numbers
1981	U (Th)	15 km east-south-east of central Bentley Lake	14	u, unidentified Th minerals	boulder of migmatized biotite gneiss reading 3900 cps; analyses 0.11% U_3O_8, 0.03% ThO_2	32, 49

Mineral Occurrences Not Identified in SMDI File

EXMI No.	Elements Present	Name of Occurrence/ General Location	NTS 64L-	Minerals Present	Host Rock/ Structures and Remarks	Reference Numbers
[1]	Cu (Fe)	9 km east of Haglund Lake	01	cp, bo, az, cov, py, po, mal	disseminated in layered metagabbro in amphibole gneiss	205, 214
[2]	U	east shore of Roberts Lake	01	not stated	boulders of pegmatite reading from 2100 to 5500 cps; analyses from 16 to 257 ppm U in area of large airborne radiometric anomaly	247
[3]	F	3 km east of Mullen Lake	01	fl	pink foliated biotite granite cut by silicic layers, veined by fluorite	214
[4]	U	northeast shore of Hull Lake	01	not stated	boulders of pegmatite reading from 2000 to 10 000 cps in area of small airborne radiometric anomaly	55, 204, 232, 249
[5]	U	2 km northwest of north end of Hull Lake	01	not stated	boulders of pegmatite reading from 5000 to 10 000 cps in area of large airborne radiometric anomaly	204, 249
[6]	Fe (C)	Mullen–Haglund Lakes area	01	py, po, gf	disseminated in frost-heaved meta-arkose	58
[7]	U	2 km east of north end of Keeping Lake	01	not stated	boulders of pegmatite reading greater than 5000 cps in area coinciding with several narrow airborne radiometric anomalies	247, 249
[8]	Fe	headland 3 km north-west of Carleton Island, Zangeza Bay	01	py	disseminated in xenolith of pelite in rhyolite enclosed in granite	164
[9]	Mo	4 km south-south-west of Reitenbach Lake	02	mo	trace disseminated in outcrop of glassy quartzite; boulder of diorite containing 15% py	202, 214, 249
[10]	Fe (As)	3 km east-north-east of north end of Hydichuk Lake	02	py, asp	5 to 15% disseminated in biotitic quartzite float	202, 214, 249
[11]	Zn (Cu, Fe, Pb)	west shore of Wagner Lake, 6 km from south end	02	py, sp, cp	trace disseminated in white quartzite float; up to 4% py	202, 214, 249
[12]	Zn (Pb)	2 km east of north end of Reitenbach Lake	02	sp, gn	minor disseminations in boulders of quartzite and metasediment over group of prominent airborne EM conductors	204, 214
[13]	Zn (Fe, C)	2 km west of north end of Reitenbach Lake	02	py, po, gf, sp	frostheave and boulders of white quartzite; sulphides, in shears and disseminated, in area of prominent airborne EM conductors	204, 214, 247
[14]	Fe	4 km northeast of northeast arm of Labach Lake	02	py	up to 2% disseminated in boulders of greywacke and white quartzite	202, 214, 248

EXMI No.	Elements Present	Name of Occurrence/ General Location	NTS 64L-	Minerals Present	Host Rock/ Structures and Remarks	Reference Numbers
[15]	Zn (Fe)	1 km west of south end of Heinz Lake	02	py, po, sp	up to 2% py, po and trace of sp disseminated in white (and some granitized) quartzite float and frost heave	202, 214, 248
[16]	Fe (Ti, Cu)	4 km west of south end of Heinz Lake	02	py, cp, il	trace to 5% py and trace cp disseminated in meta-arkose and arkosic quartzite boulders; 10% il in brecciated quartzite boulder	202, 214, 248
[17]	Fe (Cu)	3 km south of north end of Hooker Lake	02	py, mal	disseminated py, mal stain in frost heave and outcrop of arkosic quartzite	202, 214, 248
[18]	U	4 km northwest of north end of Hydichuk Lake	02	not stated	outcrop of quartzite and paragneiss reading 3000 cps (109 ppm U) near north-northwest-trending fault in area of regional airborne radiometric high	126, 202, 204, 214, 247, 249
[19]	Fe (C)	peninsulas jutting into Hartle Lake	02	po, gf	disseminations up to 10%, in white quartzite, greywacke and grey gneiss boulders in area of prominent airborne EM conductors	202, 204, 214, 247, 249
[20]	Cu (Fe, As, C)	2 km west-southwest of southwest arm of Hartle Lake	02	py, asp, po, cp, gf	minor to 5% sulphides disseminated in gneiss, white and grey quartzite and greywacke boulders in area of prominent airborne EM conductors	202, 204, 214, 249
	U			not stated	outcrop of granite and pegmatite reading 6000 cps (156 ppm U)	247
[21]	Fe (C, Pb, Zn)	northeast end of Heinz Lake	02	py, po, gf	minor to 1% disseminated sulphides in greywacke and glassy grey quartzite float, frost heave and boulders; lead and zinc known only from analyses (max. 0.03% Pb, 0.25% Zn); near prominent airborne EM conductors	55, 202, 214
[22]	Pb (Zn, Cu)	on peninsula in Fidler Bay, 3 km east-southeast of southeast corner of Strong Island	03	not stated	not stated; analysis gave 0.13% Pb, 0.13% Zn, 0.005% Cu	89
[23]	C	2 km west of Wollaston Post	03	gf	massive; host rock, structure not stated	36, 42, 89
[24]	U	Larsen Lake	03	not stated	boulders, type not stated; analyses up to 0.03% U_3O_8 and 0.01% Ni	89
[25]	U	Gow Island	03	weak secondary u	biotite granite and pegmatite boulders reading up to 2000 cps	50
[26]	Cu (Fe)	islets 3 km west-southwest of isthmus on Hungry Island	03	cp, py, po	disseminated in biotite psammite (metaquartzite) outcrops parallel to prominent airborne EM conductor	78, 81, 269
[27]	Cu (Fe)	promontory at extreme northeast end of Loranger Island	03	cp, py, mag	disseminated in quartzites near granite contact	36, 89
[28]	U (Fe)	2 km north of north end of Parks Lake	04	py, po, ur	disseminated in altered and unaltered arkosic quartzite (some brecciated), biotite and chlorite paragneiss, meta-arkose; trace to 2% sulphides; up to 0.039% U_3O_8	38, 90, 93, 125, 269

EXMI No.	Elements Present	Name of Occurrence/ General Location	NTS 64L-	Minerals Present	Host Rock/ Structures and Remarks	Reference Numbers
[29]	U (C)	Pow Bay	04	gf, u	4 m graphitic zone, pegmatite, quartz-feldspar gneiss, syenite(?) coinciding with ground EM conductor and major fault intersection (Rabbit Lake Fault); up to 300 ppm U	41, 45, 46
[30]	U (C, Fe)	4 km east of centre of Kewen Lake	04	gf, py, po, u	50% to massive graphite in shears and gouges, up to 2 m thick, in biotite paragneiss, calc-silicate, pegmatite and quartzite below Athabasca unconformity; diagenetic and regolithic alteration; up to 700 cps (0.01% U_3O_8)	115, 116
[31]	U (C, Fe, Co?)	2 km south-south-east of south end of Lampin Lake	04	py, ery?, gf, u	massive sulphides in quartzite 0.3 to 5 m thick; disseminated in quartzite biotite paragneiss, argillite, meta-arkose, garnet-chlorite-talc schists, all beneath Athabasca unconformity; local brecciation and kaolinization; up to 0.016% U_3O_8	99, 103, 104
[32]	U (C, Fe, P, Cu?)	7 km east of south end of Hidden Bay	04	py, ap, u, gf, cp?	disseminated in boulders of calc-silicate; high phosphate analyses (max. 18.5%) indicate high apatite content or possibly monazite or xenotime; disseminated and fracture-bound py, gf, cp(?) in biotite-sillimanite paragneiss in bedrock; associated prominent ground EM conductors and coincident magnetic highs and major fault intersection	42, 90, 93, 119, 128, 129
[33]	Cu (Fe, C, U?)	5 km northeast of south end of Hidden Bay	04	cp, py, bo, hem, gf, u?	disseminated in radioactive diopside marble outcrop and boulders; associated EM conductors	91, 92, 93, 119, 269
[34]	Cu (Fe)	peninsula between Hidden and Otter Bays	04	cp, tl, wo, vs, sca	disseminated in boulder of hornblendite; bedrock semipelites and biotite-amphibole-diopside psammites containing up to 50% tourmaline and calc-silicates containing wo, sca, and vs	91, 119, 269
[35]	U (Fe, C, Cu)	southeast shore of Hidden Bay	04	u, py, po, gf, cp	not stated; coincident ground EM conductors	92, 119, 269
[36]	U (C, Fe)	2 to 3 km east of north end of Lampin Lake	04	gf, py, pch, u (secondary)	disseminated and on fractures in pegmatite/paragneiss, calc-silicate and meta-arkose bedrock below Athabasca unconformity; radioactive pegmatite and meta-arkose boulders with secondary uranium stain and disseminated pitchblende, reading up to 10 000 cps	90, 93, 115, 130
[37]	Fe (As, Ni, Cu)	4 km north of centre of Black Lake	04	py, asp, ann, cp	disseminated in quartzite boulders; pyrite fracture-filling in mylonitic sillimanitic quartzite bedrock	38, 41, 90, 202, 269
[38]	U (Fe)	1 km south of Pow Bay	04	u, po	unidentified uranium minerals disseminated in radioactive pegmatite boulders reading up to 7000 cps; po disseminated in arkosic quartzite boulder	41, 38, 90, 269
[39]	U	north shore of Ivison Bay	04	pch	disseminated in actinolite-garnet rocks	202
[40]	Fe	peninsula between Ivison and Pow Bays	04	py, po	disseminated in calc-silicate boulder	202

EXMI No.	Elements Present	Name of Occurrence/ General Location	NTS 64L-	Minerals Present	Host Rock/ Structures and Remarks	Reference Numbers
[41]	Fe (C, Pb?, V?)	1 km west of centre of Black Lake	04	py, gf, va?	disseminated in chlorite gneiss, hornblende gneiss and associated pegmatites; coincides with intersection of major faults and prominent ground EM conductors	269, 273
[42]	U	5 km west-southwest of mouth of the Umpherville River	04	pch, u (secondary)	disseminated in and staining radioactive boulders of quartzite and dolomite reading up to 9000 cps; prominent associated ground EM conductors	90, 92, 120
[43]	U	3 km west of south end of Parks Lake	04	u (secondary)	staining on pegmatite and calc-silicate boulders	90, 101
[44]	U	northwest shore of Hidden Bay	04	ur	disseminated in radioactive amphibolite boulder reading 1400 cps	42, 101
[45]	U	5 km north of north shore of Burman Island	04	u	fault contact of meta-arkose and greenish quartzite with pink granite; associated swarm of ground EM conductors	42, 90, 92, 237, 274
[46]	Pb (Zn, Cu)	on southeast shore of Fidler Bay, 3 km northwest of southwest arm of Labach Lake	02	not stated	not stated	89, 224, 249
[47]	Cu (Fe, Th?)	6 km west-southwest of mouth of the Fond-du-Lac River	05	py, cp, mag	disseminated in outcrop of pegmatite; Th probable reason for count of 1700 cps; associated ground EM conductor; deep overburden sample gave maximum values of 1480 ppm Ni, 800 ppm Cu	75, 77, 123
[48]	U	6 km west of north end of Harrison Island	05	pch	pebbles of massive pch; disseminations in pegmatite boulders reading 2500 cps; associated prominent airborne radiometric anomaly and ground EM conductors	77, 122, 131, 132
[49]	Fe	east end of Harrison Peninsula	05	py, po	in grey-green quartzite boulder	41, 71, 202, 213
[50]	Cu	1 km northwest of central Hydichuk Lake	02	bo	disseminated in quartzite boulders, on prominent airborne EM conductor	202, 204, 214, 249
[51]	Fe (C)	3 km west of south end of Lasby Lake	05	gf, py	up to 5% disseminated in quartz-feldspar meta-arkose bedrock beneath Athabasca unconformity	8, 9
[52]	Fe (C)	northwest shore of Lasby Lake	05	gf, py	up to 1% disseminated in quartz-feldspar meta-arkose bedrock beneath Athabasca unconformity	8, 9, 10, 197
[53]	Cu (Fe, C)	4 km east of McClean Lake	05	py, cp, gf	disseminated in pegmatite bedrock beneath Athabasca unconformity; associated ground EM conductor	7, 9
[54]	U (C, Fe, Cu)	south shore of Lasby Lake	05	py, gf, cp, u	up to 20% py, gf in fractures and disseminated in meta-arkose beneath Athabasca unconformity; associated prominent ground EM conductor and magnetic high; maximum analysis 0.019% U	8, 9, 65, 197

EXMI No.	Elements Present	Name of Occurrence/ General Location	NTS 64L-	Minerals Present	Host Rock/ Structures and Remarks	Reference Numbers
[55]	U (Fe)	7 km west-northwest of central Harrison Island	05	py, u	up to 5% disseminated in pelite, pegmatite, granite gneiss assemblage beneath Athabasca unconformity; associated ground EM conductor and airborne radiometric anomaly; maximum analysis 0.026% U	8, 9, 10
[56]	Cu (Fe)	4 km south of Ashley Peninsula	04	cp	5 to 10% disseminated in meta-arkose boulder; on fault line with parallel prominent conductor at junction of meta-arkose/greenish quartzite with pink granite	42, 81, 90, 269
[57]	Mo	island 2 km east of northern Gillies Island	06	mo	lenses in pink granite	50
[58]	U (Fe)	small island east of Greenway Peninsula	06	py, po, u (secondary-yellow)	up to 10% disseminated and fracture bound in highly fractured granite	80
[59]	U (Cu, Fe, C)	peninsula 2 km east-northeast of northeast tip of Snowshoe Island	06	ur, py, po, cp, gf	disseminated and fracture bound in biotite paragneiss, pegmatite, calc-silicate; some sections of massive py and gf near major thrust fault	78, 79, 80, 81
[60]	Mo (Fe)	northwest shore of Ross Channel opposite central Fife Island	06	mo, py	on fractures in quartzite	84
[61]	U? (Th?)	northwest shore of Broughton Bay	07	u, ra	reading up to 16 200 cps in outcrop of biotite paragneiss with pegmatite, near granite contact	41, 249
[62]	Cu (Fe)	5 km east of east end of Bird Lake	07	mal, po	staining and disseminations in meta-arkose and calc-silicate outcrop parallel to major fault zone, and ground EM conductor and magnetic anomalies	220, 224, 247, 249
[63]	U	east shore of Henning Bay	07	u, ra	meta-arkose outcrops reading up to 5000 cps with analyses up to 366 ppm U; other radioactive elements possibly present	224, 247, 249
[64]	U (Th?)	6 km northeast of northeast end of Henning Bay	07	u?, ra	outcrop of calc-silicate reading up to 10 000 cps with analysis of 74 ppm U; other radioactive elements probably present	224, 247, 249
[65]	U (Fe)	6 km north of central Karames Lake	07	py, ur	disseminated in biotite paragneiss, segregation pegmatite and granodiorite	224, 238, 249
[66]	Fe (As)	1 km east of north end of Heinz Lake	07	py, po, asp	frost-heaved grey quartzite with associated prominent ground EM conductors	55, 202
[67]	Zn (Fe)	3 km west of north end of Heinz Lake	07	py, po, sp	up to 10% py disseminated in frost heave and boulders of white and grey biotitic quartzite	55, 202
[68]	Fe (Ni)	3 km north-northeast of north end of Heinz Lake	07	py, po	up to 5% disseminated in quartzite and mafic gneiss; up to 0.04% Ni in analyses	55, 58
[69]	Fe	small island northwest of Shaganappie Island	07	po	disseminated in skarn float	224

EXMI No.	Elements Present	Name of Occurrence/ General Location	NTS 64L-	Minerals Present	Host Rock/ Structures and Remarks	Reference Numbers
[70]	Fe (Ti)	2 km east of south end of Oback Lake	07	py, il	up to 2% disseminated in boulders of quartzite and meta-arkose outcrop	202
[71]	Zn (Pb, Fe)	3 km north of north end of Heinz Lake	07	lm, not specified (analysis only)	float and boulders of meta-arkose and quartzite containing up to 0.15% Zn and 0.1% Pb	202
[72]	Fe	Eva Lake, 2 km southeast of Smith Lake	08	mag, hem	up to 5% disseminated in calc-silicate, calcareous meta-arkose, meta-arenite and feldspathic sandstone bedrock at junction of prominent faults and diabase dyke	26, 239, 240
[73]	Zn (Fe, As)	4 km southwest of Smith Lake	08	asp, py, sp	disseminated in gneissic quartzite boulder	202
[74]	Cu (Fe)	4 km south of Eva Lake	08	py, po, cp	disseminated in boulders of gabbro and gneissic quartzite	202
[75]	Cu (Fe)	2 km north of central Ooms Lake	08	py, po, cp	disseminated in boulders of glassy quartzite and outcrops of biotitic quartzite	202
[76]	Fe	4 km south-southwest of Smith Lake	08	py, po	disseminated in quartzite and biotite gneiss boulders and frost heave	202
[77]	F (Mo)	2 km southeast of Kyle Lake	08	fl, mo	disseminated in veins of granite	164
[78]	Fe	3 km south of Smith Lake	08	po	disseminated in boulder of quartzite	202
[79]	Fe	6 km south of central Smith Lake	08	py	disseminated in gneissic quartzite frost heave	202
[80]	Fe	8 km south of central Smith Lake	08	po	disseminated in granite gneiss boulder	202, 248
[81]	Fe	1 km northwest of south end of Ooms Lake	08	po	up to 5% disseminated in grey-green quartzite frost heave	202
[82]	Fe (U?, C)	Regambal Lake	08	ra, py, gf	radioactive boulders and outcrops of granite gneiss and pegmatite reading up to 10 000 cps; py and gf disseminated in pelite and greywacke bedrock in zone of parallel linear magnetic highs and swarm of ground EM conductors covered in part by radioactive swamp	47, 241
[83]	Fe (C)	north shore of Moore Lake	08	gf, py, po	disseminated in grey biotite quartzite boulders	202
[84]	Mo (As, Fe, Ag)	south shore of Melnick Lake	09	mo, asp, py, po	up to 0.48% Mo disseminated in boulders and float of feldspathic quartzite and grey quartzite; traces in vein quartz boulders; associated prominent ground and airborne EM conductors; 3.4 g/t (0.1 oz./ton) Ag in one analysis	27, 164, 176, 202
[85]	Mo (As, Fe)	6 km west of central Melnick Lake	09	mo, asp	disseminated in quartz-feldspar breccia and sheared quartzitic pegmatite	27, 32, 164, 202
[86]	Cu (Fe)	east shore of central Gibson Lake	09	py, cp	disseminated in outcrop of diorite	27, 32, 164, 202

EXMI No.	Elements Present	Name of Occurrence/ General Location	NTS 64L-	Minerals Present	Host Rock/ Structures and Remarks	Reference Numbers
[87]	Fe (Mo, Ag, Au)	west shore of Anderson Lake	09	py, mo, po	disseminated in quartzite float, frost heave and outcrop; up to 3.4 g/t (0.1 oz./ton) Ag and 0.34 g/t (0.01 oz./ton) Au	27, 32, 164, 202
[88]	Fe (C)	west shore of Anderson Lake	09	py, po, gf, unidentified black submetallic mineral	disseminated in quartzite float and and outcrop, and graphitic diorite float; associated prominent airborne EM conductors	27, 32, 164, 202
[89]	Fe (Mo)	southwest shore of Sava Lake	09	py, po, mo	disseminated in boulder of quartzite	27, 32, 164, 202
[90]	Fe (Mo, Cu, As)	south shore of Anderson Lake	09	py, po, cp, mo, asp	up to 20% disseminated in quartzite float and boulders; up to 10% po disseminated in basic intrusive float; associated prominent airborne EM conductor	
[91]	Fe (C, Cu)	east shore of Anderson Lake	09	gf, po, py, cp	disseminated in boulders of quartzite, arkosic quartzite and schist	27, 32, 164, 202
[92]	Fe	east shore of Anderson Lake	09	po	disseminated in pyroxenite float and pyroxene-bearing quartzite boulder; associated prominent airborne EM conductors	27, 32, 164, 202
[93]	Fe (Mo, As)	east shore of Anderson Lake	09	po, mo, asp	disseminated in basic intrusive float and arkosic quartzite boulder	27, 32, 164, 202
[94]	Fe	northeast shore of Anderson Lake	09	po	in pyroxene-bearing quartzite boulder	27, 32, 164, 202
[95]	Mo (Fe)	north shore of Anderson Lake	09	mo, py	disseminated in granodiorite and arkosic quartzite boulders	27, 32, 164, 202
[96]	Fe (C)	3 km south of south end of Sava Lake	09	gf, py	disseminated in outcrop of biotitic quartzite; associated prominent airborne EM conductor	27, 32, 164, 202
[97]	Fe (Mo)	5 km south-southwest of south end of Sava Lake	09	po, pow	traces in diorite boulder; associated prominent airborne EM conductor	27, 32, 164, 202
[98]	Fe	east shore of Sava Lake	09	po, py	up to 5% disseminated in quartzite float and boulders	27, 32, 164, 202
[99]	Fe	3 km south of central Melnick Lake	09	po	disseminated in quartzite boulder	27, 32, 164, 202
[100]	Mo (Fe)	north end of Waspison Lake	09	po, mo	disseminated in white quartzite boulder	164, 176, 202
[101]	Fe (Cu)	east shore of north end of Waspison Lake	09	po, cp	disseminated in basic intrusive and diorite float; associated prominent airborne EM conductors	164, 176, 202
[102]	Fe (Cu)	east shore of central Waspison Lake	09	po, cp	disseminated in quartzite float	164, 176, 202
[103]	Fe	3 km southwest of south end of Waspison Lake	09	py	up to 15% disseminated and massive in basic intrusive boulder	164, 202
[104]	Fe	5 km southwest of south end of Waspison Lake	09	py, ma	disseminated in white quartzite boulder	164, 202

EXMI No.	Elements Present	Name of Occurrence/ General Location	NTS 64L-	Minerals Present	Host Rock/ Structures and Remarks	Reference Numbers
[105]	Fe	10 km southwest of south end of Waspison Lake	09	po, py	disseminated in white quartzite boulder	164, 202
[106]	Fe (C, As)	7 km southwest of south end of Waspison Lake	09	gf, py, asp	disseminated in biotite gneiss boulder	164, 202
[107]	Fe	7 km southwest of south end of Waspison Lake	09	py, po	up to 5% disseminated in outcrop and frost heave of feldspathic quartzite	164, 202
[108]	Fe (Cu)	5 km southwest of south end of Waspison Lake	09	py, po, ma, cp, bo, cov, native Cu	disseminated in quartzite and quartz sandstone frost heave, float and outcrop	164, 202
[109]	Fe	6 km southwest of south end of Waspison Lake	09	py	disseminated in feldspathic quartzite float	164, 202
[110]	Fe (Cu, Zn, Mo)	4 km southwest of south end of Waspison Lake	09	py, cp, sp, po, mo	up to 8% sulphides disseminated in arkosic quartzite float; cp and mo in mafic intrusive float	164, 202
[111]	Fe (Cu)	3 km southwest of south end of Waspison Lake	09	py, po, cp	up to 10% sulphides disseminated in quartzite and biotitic quartzite outcrop and boulders; associated prominent airborne EM conductors	164, 202
[112]	Fe (C)	4 km southwest of south end of Waspison Lake	09	py, po, gf	disseminated in grey-green quartzite boulder	164, 202
[113]	Fe	9 km southwest of southeast end of Waspison Lake	09	py, po	disseminated in buff quartzite	155, 202
[114]	Fe	7 km south of southeast end of Waspison Lake	09	ma, py	disseminated in white quartzite boulder	155, 202
[115]	Fe	west shore of Reid Bay	09	py, po	disseminated in grey arkosic quartzite boulders	164, 176, 202
[116]	Cu (Fe, C)	Keeler Peninsula	10	py, cp, gf	disseminated in outcrop of biotite gneiss and pegmatite	27, 32, 42, 49
[117]	Fe (As)	4 km south of central Gallagher Lake	10	po, asp	disseminated in boulders and frost heave of greywacke and quartzite	32, 155, 202
[118]	F	Trout Narrows	04	fl	disseminated in outcrop of granite; rich concentrations of crystals (up to 10 mm) in pegmatoid phases	42, 81, 90, 269
[119]	Cu (Fe)	2 km north of central Rupert Lake	10	py, po, cp	disseminated in white quartzite frost heave	27, 32, 202
[120]	Fe (Cu)	1 km northeast of northeast end of Rupert Lake	10	po, cp	up to 10% sulphides disseminated in grey quartzite float	32, 202
[121]	Fe	Ashley Peninsula	04	py, po	gossan developed over band of biotite psammite containing disseminated py; boulders of arkosic quartzite, meta-arkose and quartzite containing 2% disseminated sulphides; possibly weakly developed iron formation	54, 269

EXMI No.	Elements Present	Name of Occurrence/ General Location	NTS 64L-	Minerals Present	Host Rock/ Structures and Remarks	Reference Numbers
[122]	Cu (Mo, Fe)	2 km northwest of central McLeod Bay	10	po, pow, cp	disseminated in diorite, hornblende diorite and mafic intrusive float and boulders; centred on prominent airborne magnetic anomaly and EM conductor	27, 32, 42, 202, 220
[123]	Cu (Fe)	4 km west of central McLeod Bay	10	po, cp	up to 3% sulphides disseminated in biotitic quartzite boulder	32, 155, 202
[124]	Cu (Mo, Fe)	3 km southeast of central McLeod Bay	10	py, cp, mo	disseminated in arkosic quartzite boulder	32, 33, 202
[125]	Cu	south tip of McLeod Bay	10	bo, mal	disseminated in diorite boulder	32, 202
[126]	Cu	7 km north of central Rose Lake	10	cp	disseminated in hornblende diorite boulder	27, 32, 202
[127]	Cu (Fe)	1 km south-southeast of south end of McLeod Bay	10	cp, po	disseminated in diorite outcrop; associated prominent airborne EM conductor	27, 32, 202
[128]	Cu (Ni, Fe)	3 km northwest of central Moen Lake	10	cp, py, po	disseminated in biotite calc-silicate gneiss outcrop and frost heave	27, 32, 154
[129]	Fe (C)	peninsula in Moen Lake	10	py, po, gf	disseminated in boulder of amphibolite; associated prominent airborne EM conductor	32, 221
[130]	Fe	Ashley Peninsula	04	py, po	1 to 4% sulphides disseminated in biotite psammite, grey and arkosic quartzite bedrock; possibly weakly developed iron formation	78, 202, 269
[131]	Fe	Ashley Peninsula	04	py, po	4% disseminated in arkosic quartzite outcrop; possibly weakly developed iron formation	202, 269
[132]	U (Cu, Fe)	Moore Point near Ross Channel	11	ur, cp, py	pegmatite, pink granite	41, 42, 213, 224
[133]	U (Cu, Fe)	2 km northwest of north end of Manson Lake	11	ur, cp, py, u (secondary-yellow)	pegmatite in biotite paragneiss and meta-arkose	49, 86, 213, 235, 236, 242
[134]	P (U, Cu)	"Sid & Beavers" showing, 1 km west-northwest of north end of Parks Lake	04	mineral phase not identified	in banded radioactive arkose, calc-arkose and calc-silicate outcrop forming part of the west flank of an antiform; graded bedding and mineral assemblages suggest beds are overturned; analyses of up to 0.11% U_3O_8 and 17.75% P_2O_5; potential for Y, Ce, La has not been checked	263
[135]	U (C, Cu, Fe)	off north end of Harrison Island	05	u, gf, py, cp, hem	disseminated and coating fractures, and filling seams in meta-arkose, altered chlorite schist and metagreywacke beneath regolith at sub-Athabasca unconformity; up to 0.05% U_3O_8 in Athabasca sandstone, and up to 0.013% U_3O_8 below unconformity; up to 45% gf; associated prominent EM conductors	44, 179, 180, 181
[136]	U	west end of Scrimes Lake	12	ur, cp, py	pegmatite bedrock; readings 10 000 cps; associated prominent airborne radiometric anomalies	11, 12, 89, 213, 231
[137]	Al	Pennycook Lake	07	ad	skarn float	224

EXMI No.	Elements Present	Name of Occurrence/ General Location	NTS 64L-	Minerals Present	Host Rock/ Structures and Remarks	Reference Numbers
[138]	U (P)	8 km west of central Hatchet Lake	12	uph, aut, pch, ur	pegmatites in shear zone reading up to 7500 cps; associated prominent airborne radiometric anomaly	89, 213, 230, 231
[139]	U	3 km northwest of north end of Le Drew Lake	12	u	pegmatite boulders and outcrop reading up to 7300 cps	198, 230, 243, 244
[140]	U	5 km north-northwest of north end of Le Drew Lake	12	u	granite and pegmatite outcrops and boulders reading up to 15 000 cps; associated airborne magnetic anomaly and ground EM conductor swarm	230, 243, 244
[141]	Fe (C)	1 km south of Tromburg Bay	12	py, po, gf	up to 15% sulphides disseminated in biotite paragneiss and pegmatite, biotite-chlorite paragneiss and biotite-garnet paragneiss bedrock; associated ground EM conductor swarm and airborne EM conductor	65, 77, 87, 107, 127
[142]	U	3.5 km northeast of Fitch Rapids on the Cochrane River	15	u (secondary-yellow)	pegmatite outcrop; associated airborne EM conductor	27, 253
[143]	-	south shore of Melnick Lake	09	can	in pegmatite outcrop; may indicate nepheline syenites in vicinity	252
[144]	Pb (Zn, Cu)	13 km southwest of south end of Waspison Lake	09	not stated	in carbonate-rich arkose frost heave	164, 202
[145]	Cu (Fe)	1 km north of north shore of Linklater Bay	15	po, cp	up to 5% sulphides disseminated in boulder of diorite	27, 202
[146]	U (Th)	east of central Bannock Lake	15	u (secondary-yellow), unidentified Th minerals?	white garnetiferous pegmatite boulders reading up to 23 000 cps	27, 154, 155
[147]	Fe (C)	west shore of McGillivray Lake	15	py, gf	up to 15% sulphides, 10% gf in calcareous garnet-biotite gneiss; associated airborne EM anomaly and coincident weak magnetic anomaly	2, 222
[148]	Fe	west shore of Linklater Bay	15	po	disseminated in grey quartzite boulder	202
[149]	F (Cl, Ce?, Y?, La?, Th?)	north shore, north end of Charcoal Lake	16	fl, ala, sca	charnockite	32, 252
[150]	Cu	8 km west-northwest of central Kalheim Lake	16	cp	disseminated in granite and biotite gneiss frost heave; associated prominent airborne EM conductor and coincident magnetic high and radiometric anomaly	27, 32, 60, 202, 254
[151]	Cu (Fe)	10 km west-northwest of central Kalheim Lake	16	py, cp, gf	disseminated in biotite gneiss outcrop	27, 32, 60, 202, 254
[152]	F	7 km west of central Kalheim Lake	16	fl	hornblende diopside gneiss; associated airborne EM conductor, subparallel magnetic high	27, 32, 60, 245, 252, 254
[153]	Fe	northeast end of Charcoal Lake	16	py, po	disseminated in biotite calc-silicate gneiss outcrop; associated prominent airborne EM conductor	27, 32, 202

EXMI No.	Elements Present	Name of Occurrence/ General Location	NTS 64L-	Minerals Present	Host Rock/ Structures and Remarks	Reference Numbers
[154]	Cu (Zn, Fe)	east shore of central Charcoal Lake	16	py, po, sp, cp	metadiorite boulders and frost heave and paragneiss outcrop; associated airborne EM conductor, coincident magnetic anomaly and radiometric anomaly	27, 32, 154, 202
[155]	Fe	north end of peninsula on northwest side of Matthews Bay	16	py, po	disseminated in biotite calc-silicate gneiss outcrop; associated prominent airborne EM conductor	27, 32, 202
[156]	Cu (Fe)	peninsula on northwest side of Matthews Bay	16	po, cp	disseminated in grey quartzite boulder	27, 32, 202
[157]	Cu (Fe)	2 km east of central Matthews Bay	16	po, cp	disseminated in grey quartzite boulder	27, 32, 202
[158]	Cu (Fe)	3 km east of Matthews Bay	16	py, cp	disseminated in grey quartzite boulder	27, 32, 202
[159]	Cu (Fe, C)	Daschuk Lake	16	po, gf, cp	disseminated in biotite calc-silicate gneiss outcrop; associated prominent airborne and ground EM conductor swarm and coincident ground magnetic anomaly	27, 32, 61, 154, 202
[160]	Cu (Fe)	east shore of Daschuk Lake	16	py, cp	disseminated in biotite gneiss outcrop; associated prominent airborne and ground EM conductor swarm, coincident ground magnetic anomaly	27, 32, 61, 154, 202
[161]	Cu (Fe)	7 km east of north end of Pikusikun Lake	16	po, cp	disseminated in boulder of pelitic biotite gneiss	27, 28, 32, 61, 62, 202
[162]	Fe (As) U (Th)	4 km east of north end of Gibson Lake	09	po, asp, u, unidentified Th minerals	disseminated sulphides in biotitic quartzite boulder; up to 0.02% U_3O_8 and ThO_2 in pegmatite boulder and outcrop	27, 32, 164, 202
[163]	Cu (Fe, As, Mo)	northwest shore of Rupert Lake	10	cp, py, po, asp	up to 10% sulphides disseminated in quartzite frost heave; traces in calc-silicate outcrop; associated prominent airborne EM conductors	27, 32, 164, 202
[164]	Cu (Fe)	east shore, central Gallagher Lake	10	cp, py	disseminated in biotite gneiss frost heave	28, 32, 154, 155, 202, 220, 249
[165]	Fe (Mo, As)	4 km southwest of southwest end of Rupert Lake	10	asp, pow	up to 20% sulphides disseminated in quartzite float	27, 32, 202, 220
[166]	Cu (Fe, Mo)	east shore, central Gallagher Lake	10	cp, po, py	up to 6% sulphides disseminated in granite gneiss and quartzite boulders; 2% in greywacke outcrop	28, 32, 155, 202
[167]	Zr (Th?, Hf?)	north end of Kosdaw Lake	13	zr	Athabasca quartz pebble conglomerate subcrop and boulders reading 200 cps	198, 199, 231, 244
[168]	U (Th)	1 km east of north end of Burrill Bay	15	u, unidentified Th minerals	boulder of pink pegmatite reading 1400 cps; analysis trace U_3O_8 and ThO_2	28, 30, 32, 33, 49
[169]	Fe	southeast end of Haglund Lake	01	py, po	disseminated in layered gabbro	205, 214
[170]	Al	southwest corner of, and islet next to, Kukelko Island	06	cor, ct, hercynite	inclusions of aluminous pelite in migmatite envelope of Shaganappie Granite, containing up to 60% cordierite	13

EXMI No.	Elements Present	Name of Occurrence/ General Location	NTS 64L-	Minerals Present	Host Rock/ Structures and Remarks	Reference Numbers
[171]	Al	McRae Bay	07	ct	inclusions of aluminous pelite in migmatite envelope of Shaganappie Granite, containing up to 40% cordierite	13

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